# Mission Ready: Leveraging Performance-Based Training to Enhance Security Operations Proficiency

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## ABSTRACT

Security operations personnel must be prepared to apply specialized skills, regulations, and job-specific knowledge in increasingly complex operational environments. Traditional training models often prioritize theoretical knowledge over application, creating a critical gap in operational readiness. Because rapid response and precision decision-making are critical to operational dominance, the Transportation Security Administration's Security Inspectors must meet the highest standards of proficiency quickly. The Transportation Security Inspector (TSI) role is cognitively demanding when analyzing high-stakes security situations. The traditional four-phase TSI curriculum included prerequisites, the basic course, on-the-job training, and a final phase that presented advanced intermediate to journey-level tasks. This structure presented challenges in consistent performance, job proficiency, and operational efficiency, particularly in interpreting regulations that demand cognitive agility and judgment. Due to emerging needs, this curriculum required redesign to meet post-entry level proficiency in a shorter timeframe by integrating the advanced journey-level tasks into the basic course. How does one redesign such a large program to meet a higher proficiency level in less time while retaining high performance standards?

This paper examines the implementation of an integrated method for creating measurable training outcomes by prioritizing performance throughout the instructional design process. By capturing Critical Performance Indicators (CPIs) at the outset, such as common errors and job-task order, this method shifts the focus to contextualized learning strategies that reinforce metacognitive awareness, decision-making, and applied learning. Contextualized scenarios, case studies, and simulation exercises ensure that skills are learned, retained, and applied under authentic operational pressures. Levels 1 and 2 evaluation data indicate quantifiable gains in task proficiency, security readiness, and decision-making accuracy. This paper presents key findings and best practices in designing performance-based security training programs that support workforce development and mission readiness—ensuring that security personnel are not just trained but also prepared for operational dominance in real-world situations.

## ABOUT THE AUTHORS

**Dr. Denise Rose Stevens** is the Director of the Learning Center of Excellence for General Dynamics Information Technology. She has over 35 years of experience in the application of the instructional systems design process, human performance technology and applied research and development of transformative learner-centered design for government and education. Dr. Stevens has extensive experience in the design of training and performance support systems and job performance measures. She has led large-scale courseware development efforts resulting in over 15 national awards. Dr. Stevens' end-to-end expertise includes cognitive and behavioral job-task analysis, learning objective development, instructional and performance-centered design for various training platforms (such as web-based, classroom-based, or blended deliveries), conducting test reliability and validity procedures, and conducting formative and summative courseware evaluations. Dr. Stevens has over 10 years of experience as an Adjunct Professor of Foreign Languages and is currently a Lecturer at the University of Central Florida's College of Community Innovation and Education.

**Dr. Rebecca Taverner-Coleman** is a Learning Development Specialist Advisor at General Dynamics Information Technology. She has over 25 years of experience in education and instructional design across corporate, higher education, and government sectors. She has developed a variety of e-learning, instructor-led, and hybrid training solutions, specializing in creating engaging, research-based instruction that drives learner performance and

organizational impact. She has contributed to award-winning courses and led design and development teams in higher education and workforce training. Dr. Taverner-Coleman is a 2023 Page Turner Award Finalist, and a 2023 Shelf Unbound Notable Indie winner for her novel *Vagabonder*. For the Transportation Security Inspector Basic curriculum, Dr. Taverner-Coleman developed lesson content for topics related to the investigation process and surface transportation.

**Julie Kilbert** is a Security Training Integration Analyst at General Dynamics Information Technology. She has 23 years' experience supporting the development and integration of TSA training programs. She routinely works with curriculum development/technical writers and instructional system designers to ensure the development of Train the Trainer (T-3) materials align with TSA-Academy's model for self-directed and peer-to-peer learning as well as developing realistic training scenarios, group activities, and robust training exercises for use in TSA Training courses. Ms. Kilbert delivers T-3 course materials and provides ongoing instructor feedback using effective coaching/mentoring techniques, effective questioning tools/strategies, and providing developmental feedback. Additionally, she provides Subject Matter Expertise and support for operational pilots and field assessments to ensure compliance with Standard Operating Procedures.

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## THE LANDSCAPE OF SECURITY OPERATIONS

Since its inception in 2001, in the wake of the 9/11 tragedy, the Transportation Security Administration (TSA) has continuously strived to protect and maintain a strong security posture to prevent large-scale acts of terrorism. The 2001 attacks forever changed the world's perception of security threats. This attack was the first time that airline passengers were used as weapons instead of bargaining tools, and it demonstrated a vulnerability within the transportation sector that could once again be leveraged with dire consequences. TSA's mission is clear: to protect our nation's transportation systems by ensuring freedom of movement for people and commerce. TSA safeguards all transportation systems to include aviation, rail, transit, highways, pipelines, and ports. TSA achieves its mission by implementing a layered, risk-based approach through working with multiple partners in law enforcement, intelligence, and the transportation sector. Over the years, as threats evolve in complexity, TSA continuously readdresses its current state to implement new risk-based security procedures and more sophisticated equipment. For example, TSA implemented enhanced footwear screening procedures; enacted the 3-1-1 liquids rule in all carry-on bags; and installed advanced imaging technology to detect non-metallic weapons, explosives, and other possible threats on persons during the screening process.

The Role of the Transportation Security Inspector (TSI) TSA employs a variety of professionals, such as Transportation Security Officers (TSOs), Transportation Security Inspectors (TSIs), Transportation Security Specialists (TSSs), and Federal Air Marshalls (FAMs), amongst other critical TSA roles. The TSI is a regulatory, professional role focused on identifying security vulnerabilities in the transportation network and supporting outcome-focused mitigation activities to gain compliance. There are currently over 1,300 TSIs and Supervisory TSIs at TSA who are managed by over 61 Compliance Hubs across the United States and overseas. As part of their core duties, TSIs work extensively with thousands of stakeholders ranging from U.S airports, foreign and domestic air carriers, cargo screening facilities, aircraft repair stations, and surface systems. According to 2024 metrics, TSA handled over 150,000 compliance activities. The complex TSI role is further exacerbated by three general areas of assignment, called "modes." Upon completion of initial training, each TSI is assigned to a specific mode of transportation—cargo, surface, or aviation—that has its own unique compliance regulations.

The nature of the job is complex as it relies heavily on the knowledge, interpretation, and application of over 460 regulatory directives, hundreds of supporting documents, and 24 specific parts of the Code of Federal Regulation (CFR). Core duties include assessments, inspections, investigations, incident management responses, and outreach. The TSI's job is also cognitively demanding as it places a significant number of requirements on the individual's mental faculties. It requires a high level of intellectual engagement, as TSIs must apply critical-thinking skills, memory recall, attention to details, situational awareness, analysis, problem-solving, and decision-making to every situation. In addition, the consequences of incorrect determinations, particularly in stressful situations, are significant. The TSI's job tasks require continuous interpretation of subjective regulations and directives. Rapidly assessing compliance or non-compliance accurately, consistently, and proficiently remains the position's greatest challenge.

### The TSI Legacy Training Requirements

The legacy TSI training program, which had been in existence for several years, consisted of a four-phase curriculum where Phases II and IV were completed in-residence at the TSA Academy. Phase I consisted of airport familiarization courses delivered face-to-face and online through the TSA Learning Management System (LMS). As shown in Figure 1, Phase I was to be completed prior to Phase II, which included five weeks of academy instruction covering specific training in all three modes. Successful completion of Phase II required passing an end-of-course Job Knowledge Test (JKT), which consisted of approximately 50 knowledge-based questions. Phase III included a two-week On-the-Job Training (OJT) program at a designated airport, combined with several months of shadowing a fully credentialed TSI. Phase IV featured a two-week course consisting of more advanced tasks designed as capstone activities. At the completion of the fourth phase, trainees were deemed fully credentialed. While Phase II included five weeks of intensive training, the entire legacy program could take up to one year to complete. Although TSIs were slotted for one of the three job modes—aviation, cargo, or surface—prior to completing Phase II of the training program, all trainees were required to attend lessons that covered all three modes.

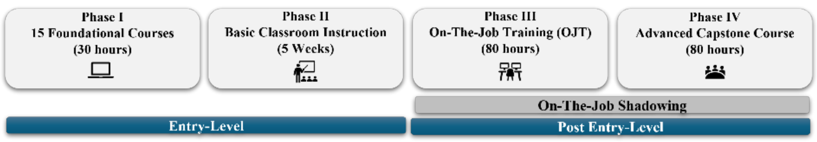


**Figure 1. Legacy TSI Curriculum**

## THE TSI LEGACY TRAINING CHALLENGES

A curriculum review conducted by TSA leadership identified significant inefficiencies in the existing four-phase certification program for TSIs. The review found the curriculum to be overly long and redundant, with course materials requiring substantial updates to reflect current regulatory information. Phase II was primarily focused on knowledge acquisition, delaying practical application of job-specific processes until the OJT and OJT-shadowing phases. Moreover, TSIs assigned to a specific operational mode were required to complete training for all three modes, resulting in unnecessary repetition and reduced training efficiency. In addition, Level 1 evaluation results collected over a five-year period revealed consistent trainee feedback indicating the need to restructure the curriculum. Trainees recommended reordering the content to provide greater contextual understanding of the role, which would support more accurate interpretation of regulations that require cognitive reasoning and professional judgment.

TSA leadership was interested in reducing the number of training days and in-person training events, specifically combining Phases II and IV into one phase prior to OJT without extending or adding days. This approach would result in combining two levels of proficiency into one, where upon completion of the five-week, two-day training for Phase II, TSIs would be able to perform job duties at a post-novice level. This new approach would not only accelerate trainee performance proficiency in their assigned mode but also reduce training completion time and cost. Another key objective was to align the revised curriculum with stringent federal standards to support the academy's pursuit of accreditation. The training need posed the following questions:

1. How can two proficiency levels be combined into one phase without extending the current training or adding additional training in the curriculum?
2. How can Phase II be designed where, upon completion of the training, TSIs can perform at a post-novice level?
3. How can three variations of the same complex job be taught without redundancies?
4. How can the Phase II course cater better to TSIs assigned to specific modes?

## AN INTEGRATED PERFORMANCE-BASED APPROACH

For job positions that are cognitively demanding, different design approaches are needed to ensure that learning taps into proficiency levels that go beyond the simple transfer of knowledge and result in an accurate and measurable change in performance. For entry-level curricula, there is a tendency to first focus on knowledge acquisition before introducing application, overlooking the advantages of integrating practical skills with job performance from the outset. Effective instructional design emphasizes both knowledge and performance, addressing cognitive demands and behavioral aspects of the job equally. This balanced approach enables learners to build true proficiency rather than simply acquire information. The Integrated Performance-Based Method (Figure 2), grounded in this human performance paradigm, is predicated on four fundamental theoretical concepts: contextualized learning, metacognitive awareness, performance support, and assessment accountability.

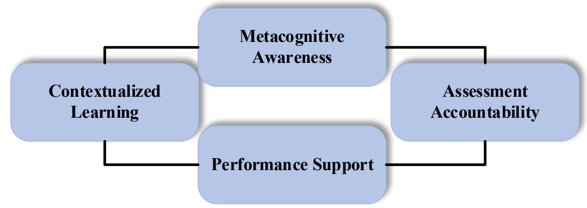


**Figure 2. Integrated Performance-Based Method**

**Contextualized Learning**

The concept of contextualization is drawn from the Cognitive Flexibility Theory developed by Dr. Rand J. Spiro, which emphasizes the ability to adapt knowledge and apply it across varied, real-world contexts (Spiro, Coulson, Feltovich, & Anderson, 1988). Cognitive flexibility theory focuses on presenting information from multiple perspectives and incorporating case studies that offer diverse, context-rich examples to promote deeper understanding and knowledge transfer. Spiro asserts that effective learning is context-dependent, and knowledge should be highly interconnected rather than compartmentalized. Contextualized learning places instructional content within realistic scenarios reflective of the TSI's daily job responsibilities. Instead of abstract or theoretical presentations, regulatory and procedural knowledge is anchored in authentic workplace tasks, such as performing inspections, managing compliance assessments, or responding to security incidents.

**Metacognitive Awareness**

Metacognition refers to the awareness and knowledge of one's own cognitive states and processes and the ability to control these processes (Paris & Winograd, 1990). In other words, metacognition includes two groupings of processes: (1) self-awareness or knowledge of cognitive states and processes and (2) self-regulation over the cognition. Metacognitive awareness involves teaching learners to reflect on their thought processes, decision-making strategies, and problem-solving methods. Given that TSIs often interpret complex regulations and make critical decisions under pressure, cultivating this self-awareness is essential.

**Performance Support**

Performance support integrates targeted tools and resources into the instructional event to access critical guidance when learners need it. Examples include interactive job aids, procedural checklists, infographics summarizing regulatory steps, and authentic simulation environments. Performance support tools that provide relevant regulatory details, procedural information, and contextual guidance enhance accuracy, efficiency, and confidence, especially during complex operational scenarios. According to Rosenberg (2013), integrating performance support tools within training programs significantly boosts performance and reduces error rates by providing immediate, context-specific guidance. Similarly, Gottfredson and Mosher's (2011) "Five Moments of Need" framework emphasizes the importance of providing just-in-time support precisely when learners encounter challenges during job tasks.

**Assessments with Accountability**

Multiple assessment methods, such as formative assessments, summative performance evaluations, and competency-based simulations, are integrated to provide comprehensive and continuous performance measurement. Formative assessments such as knowledge checks and individual and group activities are strategically positioned throughout the training to offer real-time feedback, allowing learners and instructors to address skill deficiencies and misconceptions. Research by Wiggins and McTighe (2005) supports the integration of authentic assessments, emphasizing the importance of demonstrating real-world competencies rather than rote memorization of theoretical knowledge. Their framework for backward design promotes clear and measurable learning outcomes, systematically aligning instructional strategies and assessments with operational performance expectations. Accountability within assessments ensures that training outcomes directly correlate with real-world operational effectiveness and safety. Through comprehensive, accountable assessments, the curriculum ensures sustained proficiency, operational preparedness, and measurable improvements in job performance, which support TSA's strategic goal of maintaining high security standards and operational dominance.

## HOW DID WE GET THERE?

### Capturing Critical Performance Indicators (CPIs)

Redesigning the TSI curriculum required more than applying theoretical principles. It demanded a data-driven approach grounded in real job requirements. To elevate proficiency standards, the design team began with a rigorous front-end analysis to capture detailed job data across all three operational modes. A comprehensive job task analysis identified 15 duties (5 per mode), 117 major tasks, and 564 subtasks. Beyond generating a task inventory, the team captured multiple performance attributes, including CPIs essential for job success.

Derived from the concept of Key Performance Indicators (KPIs), as shown in Figure 3, CPIs provide additional information on specific tasks for training emphasis to maximize performance and accelerate the path to proficiency. In the case of this effort, three specific CPIs were captured for each task: Metacognitive characteristics, common performance errors, and task learning difficulty.

| | | |
|---|---|---|
| Duties, Tasks, and Sub-Tasks | Tools, Systems, Software, and Equipment | ✓ Task Learning Difficulty |
| Job Task Conditions & Standards | ✓ Metacognitive Characteristic – Best Practice and Shortcuts | Percent of Time Performing Task |
| Initiating & Ending Cues | ✓ Common Performance Errors | Probability of Performing Correctly |
| Knowledge, Skills, and Abilities | Core Competencies | Time Between Job Entry and Task Performance |
| Environmental Setting & Constraints | Difficulty, Importance, Frequency (DIF) | Training Task Conditions & Standards |

**Figure 3. Critical Performance Indicators**

Metacognitive characteristics tap into the ability to perform tasks at a higher level of proficiency by applying the knowledge, strategies, and decision-making approaches used by advanced performers and subject matter experts (SMEs). These characteristics are rarely documented in standard references or training materials; instead, they surface during analysis sessions with experienced SMEs. Often framed as "lessons learned," they include tips, heuristics, shortcuts, and practical insights that reflect real-world expertise. Emphasizing these elements in instruction helps bridge the gap between novice and expert performance, accelerating learner development.

Another CPI captured during analysis was common performance errors. These are frequent mistakes or cognitive biases and mistakes that tend to occur when executing complex or ambiguous tasks. Because such errors can lead to cascading negative outcomes, the course incorporates strategies to recognize and avoid them. These strategies are emphasized during training to enhance decision-making and reduce the risk of operational failure. Task learning difficulty data offers critical insight into factors that influence how challenging a task may be to master in a training environment. These metrics help identify the cognitive load, and the level of ambiguity or uncertainty involved in its execution. All three types of CPIs—metacognitive characteristics, common performance errors, and task difficulty—were integrated into the revised Phase II course to support an accelerated path to proficiency.

### Job-Tasks Sequencing

To ensure that key regulatory differences across the three modes of the TSI job were accurately captured, separate data collection sessions followed the initial job analysis portion of the study. This multi-mode analysis approach enabled the design and development team to distinguish common tasks shared across all modes from mode-specific requirements that warranted separate instructional delivery. An additional step not normally implemented in the Job Task Analysis (JTA) data collection process involved sequencing the major tasks and sub-tasks. While tasks in the operational environment are not always performed linearly, the team of analysts and SMEs collaboratively established a logical job sequence for those tasks that could occur in varying orders on the job. This agreed-upon sequence allowed the design and development team to structure the Phase II course in a way that presents the job from start to finish, facilitating a coherent and logically progressive learning experience.

## ACCELERATED PATH TO PROFICIENCY

During the design phase of the project, careful consideration was given to the cognitively demanding nature of the TSI role. Redesign activities addressed both the curriculum and Phase II course levels.

### Streamlined Curriculum Structure

To address the inefficiencies and redundancies of the legacy four-phase curriculum, the training was restructured into three streamlined phases. Under the previous model, TSIs spent significant time in classroom instruction and on-the-job training (OJT), delaying their ability to perform critical job tasks independently. The lack of immediate, structured practice opportunities, combined with a reliance on OJT for skill validation, often resulted in inconsistent proficiency levels and delayed job readiness. As shown in Figure 4, the revised three-phase curriculum prioritizes immediate immersion in essential tasks. Learners engage in structured simulations and scenario-driven training from the outset, directly applying their knowledge of regulatory compliance within controlled environments. This approach adheres to established instructional design principles that emphasize the importance of timely and targeted skill practice (Branch, 2009). Immediate engagement in performance-based tasks enhances skill acquisition and retention, supporting learners in developing proficiency early. According to research by the National Training Laboratories, learners retain up to 75% of what they learn when they practice tasks rather than passively receiving information (NTL Institute, 2021).

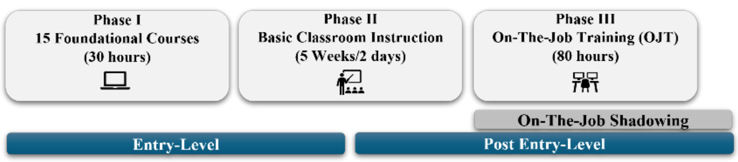


**Figure 4. New TSI Curriculum Structure**

Reducing dependency on OJT as the primary mode of skill validation mitigates the risks associated with inconsistent or delayed feedback and uneven skill development. Structured classroom simulations and practice scenarios provide a controlled and safe environment where learners receive immediate feedback to support their meeting standardized performance outcomes. The U.S. Department of Labor notes that structured training environments improve skill consistency and reliability (U.S. Department of Labor, 2022). Reducing the number of phases in the curriculum provides direct benefits, notably accelerating proficiency development, improving operational readiness, and reducing training time and associated costs. Such structural optimization meets rigorous federal accreditation standards, ensuring compliance and maintaining high-quality training outcomes (FLETA, 2023). Once the curriculum level was re-structured, the Phase II course redesign addressed both the course structure, and the methodologies used for instruction to maximize learning transfer and retention and to elevate proficiency.

### Establishing a Job-Context Course Structure

To address two major issues—the legacy course's insufficient emphasis on hands-on activities and trainee concerns about receiving training in all modes despite being assigned to just one—the Phase II course underwent significant restructuring. As shown in Figure 5, the revised course is organized into instructional blocks where the job is taught multiple times with added layers of difficulty, starting with Block A. **Block A—Common Core** introduces foundational job concepts applicable across all modes. **Block B—Common Core Inspection, Investigation, and Enforcement** uses a single regulation as a unifying thread to teach core job processes shared across modes. This block incorporates a hands-on activity conducted in a mock facility, allowing

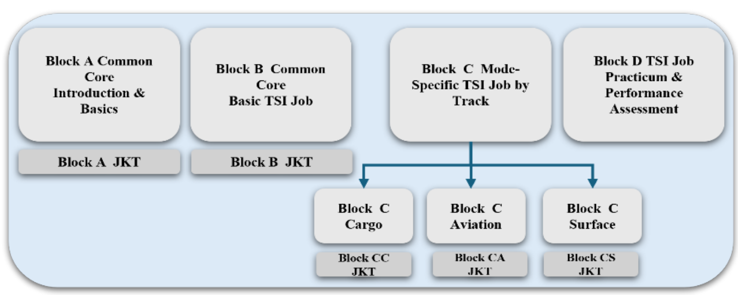


**Figure 5. New TSI Course Structure**

trainees to apply what they've learned in a realistic environment. Once trainees complete the Common Core blocks and demonstrate a solid understanding of fundamental skills, they move on to **Block C—Mode-Specific Tracks: Aviation, Cargo, and Surface Concepts**. These tracks focus on the unique regulatory content and tasks associated with each job mode. Trainees are assigned to the track that aligns with their designated operational role, eliminating unnecessary instruction in unrelated modes and ensuring targeted, practical preparation. With a solid foundation in their assigned mode, trainees advance to **Block D—Mode-Specific Compliance Practicum**. In this block, trainees engage in hands-on practical activities within the mock facility designed to emulate real-world operational scenarios. Trainees prepare for and perform mode-specific tasks such as interacting with stakeholders, conducting interviews, reviewing and analyzing documentation, interpreting security regulations, applying decision-making strategies, collecting evidence, and evaluating findings to determine compliance. The practicum reinforces performance expectations and allows trainees to demonstrate mode-specific job-ready proficiency under authentic conditions.

**Designing Contextualized Learning**

Once the course was restructured, the next step was to redesign the content using a job-context strategy that directly connected regulatory knowledge to job-specific applications. Recent shifts toward performance-focused training across security sectors underscore the importance of training in the context of the job. According to a study by Clark and Mayer (2016), integrating knowledge with workplace tasks not only improves retention but significantly boosts on-the-job application. TSIs must analyze regulatory directives and apply them accurately across various operational scenarios, such as compliance checks at cargo facilities or security inspections at transit terminals. Industry standards dictate proficiency in applying these directives swiftly and accurately due to the immediate safety implications of the TSI role. This shift moved the course design beyond theoretical instruction toward applied proficiency. The job-context strategy flipped the legacy approach, which initially emphasized extensive transfer of knowledge, skills, and abilities (KSAs) related to regulatory directives and reserved performance application for Phase III during the OJT period. In the redesigned model, job context is introduced in Phase II to serve as an anchoring mechanism, allowing trainees to cognitively link KSAs to the specific tasks and duties of the role. This direct connection is immediately relevant, impactful, and executable in real-world contexts.

As shown in Figure 6, the job-context strategy structured each lesson within the instructional blocks using a layered, scaffolded approach. **Block A (Crawl)** introduces prerequisite job knowledge through simple overviews and foundational concepts. **Block B (Walk)** presents core job tasks in manageable steps, emphasizing guided practice. **Block C (Run)** increases task complexity, supporting the development of novice and post-novice proficiency through mode-specific instruction and application. Finally, **Block D (Fly)** reinforces full job performance through realistic, scenario-based practice and assessment to ensure that trainees are capable of independent, proficient execution of their job responsibilities.

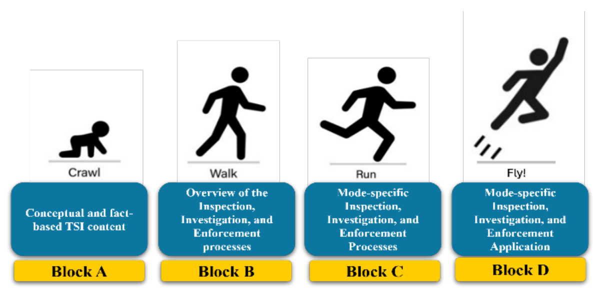


**Figure 6. Job-Context Strategy**

This approach is based on task-centered learning principles outlined by Merrill (2002), which emphasizes using authentic tasks to facilitate learning. Merrill's First Principles of Instruction stress contextualized task-based training to support skill transfer (Merrill, 2002). The course structure and design directly align with these principles, ensuring regulatory knowledge is contextualized in genuine job tasks, enhancing both retention and transfer of knowledge. The structural adjustments made at both the curriculum and Phase II levels streamline the training, accelerate learner proficiency, and ensure that TSIs are effectively prepared for operational demands in each of their modes when they are on the job, setting the stage for an accelerated path to proficiency. Additional instructional strategies were incorporated into the Phase II course using the four concepts of the Integrated Performance-Based Method: contextualized learning, metacognitive awareness, performance, and assessment accountability to improve TSIs' operational proficiency, thereby increasing their readiness for immediate task performance.

**Contextualized Instruction**

Other contextualization strategies that were incorporated into the course included case studies used as examples and scenarios for practice opportunities designed as group or lab activities. The scenarios, at times threaded throughout multiple lessons, reflected different levels of complexity and used authentic artifacts for better understanding and retention of key processes and concepts. These materials included forms, letters, and software screen captures that directly tied to the tasks of the job.

**Metacognitive Awareness Strategies**

In addition to embedding metacognitive task characteristics, such as best practices, lessons learned, and practical tips, Phase II course design integrated additional strategies to foster the mental preparedness essential for success in the TSI role. One such strategy is the introduction of the TSI Mindset, which is reinforced throughout the course. This mindset is defined using the mnemonic PARTNER, with each letter representing a core component of the professional disposition and cognitive approach expected of TSIs in operational settings.

- **P**–Plan accordingly to accomplish my duties
- **A**–Anticipate and address issues proactively
- **R**–Reach out early and often to communicate with stakeholders, colleagues, and leadership
- **T**–Think critically and act decisively
- **N**–Need to know current regulations and programs
- **E**–Engage with stakeholders effectively
- **R**–Resolve to be ethical, fair, and trustworthy

For example, in the Stakeholder Engagement lesson, trainees align the TSI Mindset components to the strategies necessary for engaging stakeholders as part of their duties. Another reflective strategy integrated at the end of each lesson is a structured opportunity for review and reflection using the **TIME 2 PAUSE method**. This strategy guides trainees through targeted reflection questions, allowing them to consolidate learning and deepen understanding. Trainees complete a formatted worksheet that prompts them to apply one or more reflective techniques, reinforcing key concepts and promoting metacognitive awareness.

**Performance Support Strategies**

To further reinforce the Phase II course's performance-based structure, various targeted performance support tools were integrated at the lesson level. Most notably, an **Interactive TSI Course-Level Job Aid** was developed as an advance organizer and referenced throughout the course. This tool is grounded in the principles of Process Mapping, which emphasize visually representing the cognitive steps of a task to establish a shared understanding of the entire process, in this case the full scope of the TSI role. By making the sequence and interdependencies of tasks explicit, the job aid supports cognitive organization, real-time application, and long-term retention. The **Interactive TSI Course-Level Job Aid** was created using job and tasks flow data captured during the JTA to provide a structured, step-by-step visual guide for assessing alleged non-compliance or security violations. Designed in a flow diagram format, the job aid visually represents each step and decision point in the process. Instructors reference the job aid throughout the course, typically at the beginning of relevant lessons, to contextualize how the instructional content aligns with real-world job functions. This tool is grounded in the principles of Process Mapping, which emphasize visually representing the cognitive steps of a task to establish a shared understanding of the entire process, in this case the full scope of the TSI role. Consistently linking regulatory KSAs to the structure and processes of the job through this tool alleviates cognitive overload and reinforces the practical application of training content.

**Strategies for Assessment Accountability**

To ensure training effectiveness and accountability, the revised Phase II course incorporates rigorous JKTs strategically placed at the end of each block. A trainee must pass three JKTs—one each for Blocks A, B, and mode-specific C—then complete a practical skills demonstration at the end of Block D. The practical skills demonstration takes place in an immersive lab environment mirroring a typical TSI work-setting, giving trainees an opportunity to engage with robust, authentic simulations and scenarios that require the application of all that they have learned throughout the course, using rubrics to provide direct feedback. This practical skill demonstration also prepares the trainees for Phase III OJT, where a similar rubric is employed.

Unlike the legacy course, which included only a single end-of-course assessment, the redesigned course incorporates multiple criterion-referenced JKTs to evaluate trainees' progress more effectively. These JKTs enhance internal validity and ensure traceability to the course's learning objectives. While the original JKT consisted of 50 knowledge-based questions, the updated assessments align with the performance standards of all the Terminal Learning Objectives (TLOs). The revised JKTs feature scenario-based performance items that assess trainees' ability to apply decision-making and problem-solving skills within job-relevant contexts that closely simulate real-world operational situations. This performance-focused assessment approach shifts the program away from traditional knowledge recall and emphasizes applied skill proficiency and performance reliability under authentic workplace conditions.

These higher-level assessment items were intentionally designed to align with the cognitive demands outlined in Bloom's taxonomy, spanning from Remembering (level 1) to Evaluating (Level 5), consistent with the course's learning objectives. To support both rigor and fairness, two variants of the JKT were developed, each containing approximately 30 items. This approach ensures that trainees have a second opportunity to demonstrate proficiency if they do not meet the minimum passing criteria on their initial attempt.

## THE RESULTS

### Level 1 Evaluation Results

The revised Phase II course underwent evaluation through two procedures utilizing a combination of Kirkpatrick's Levels 1 and 2 methodologies (1994). These evaluations captured participants' reactions to the course materials, collected data to verify instructional validity, and determined whether learning occurred. For each event, 24 participants representing the target audience population consisted of new or novice TSIs who completed the prerequisite training. The level 1 evaluation methodology included direct observation, hot-wash sessions, capturing time stamps, and administering block-level and end-of-course level validation surveys that were specifically developed to capture participants' opinions of the course, the training benefit, the tests, and the training facilities. Participants were required to indicate their level of agreement with several positively worded statements (e.g., I understood the learning objectives) using a scale ranging from 5 (Strongly Agree) to 1 (Strongly Disagree). For each question on the Level 1 survey, the development team computed the mean, standard deviation (SD), and range of the scores.

Overall, the course was well received by the participants with opportunities for improvement based on a mean of agreement rating of 4.045 for both events. One consistent comment for Event 1 was that the trainee guide format was not conducive to their preparation for the JKTs. The original format was designed for notetaking with some pertinent references and slide thumbnails. Participants felt that the format needed to include more information on what is covered in each of the 70 lessons of the course. The Trainee Guides were reformatted to mirror lesson plans but without instructor-specific information prior to final deployment.

### Level 2 Evaluation Results

For the level 2 validation effort, a standard pretest and posttest comparative analysis method was used to determine if learning occurred. This evaluation method assumes that new TSIs who fail the pretest and complete the block of instruction will pass the posttest, thus demonstrating learning gains. Evaluating whether the target audience acquired the intended knowledge, skill, and attitudes from the course validation events provided valuable insights into whether learning gains occurred. Validation procedures were conducted at the block level for Blocks A, B, and the three C tracks, using the first variant as the posttest and the second variant as a pretest. The validation study excluded Block D because it was initially determined that this practicum would not count as a passing criterion for the successful completion of the course. This decision was eventually changed due to trainees' Level 1 feedback.

The validation methodology used for this study is based on standard best practices and is derived from the Department of Defense Handbook, Instructional Systems Development/Systems Approach to Training and Education (MIL-HDBK 29612) and the U.S. Army Training and Doctrine Command (TRADOC) Circular 351-88-1 Sequential Validation Procedures. Sequential validation procedures are used because of the target audience's small population size, with a maximum class capacity of 24 seats per implementation event. A simplified version of sequential validation procedures was applied and used a minimum passing criterion of 80% for each test. The minimum passing raw score for each pretest and posttest was calculated based on the total number of test items in each test: 20 test items for Block A, and 24 test items for Blocks B and C. Out of all the participants who failed the pretest (true sample population), a minimum of 80% of participants needed to pass the posttest for the block to be considered validated. Learning gains were also calculated based on pretest and posttest scores for all participants, to include those who initially passed the pretest. All participants passed the posttest for Blocks A, B, and C by assigned mode.

**Table 1. Validation Results and Learning Gains by Block**

| Block | Did the Block Validate? | Average Learning Gains |
|---|---|---|
| Block A | Yes | 25% |
| Block B | Yes | 38% |
| Block C–Aviation | Yes | 31% |
| Block C–Cargo | Yes | 25% |
| Block C–Surface | Yes | 17% |

The comparative analysis of the pretest and posttest scores from both evaluation events indicates successful validation of the course by block, demonstrating average learning gains of 27% of all participants who initially failed the pretest and passed the posttest. Additionally, a test item analysis was performed on the 290 items from both test variants to identify trends in responses and the root cause where at least 50% of the participants responded incorrectly. The result of the test item analysis identified 17 questions (5.86%) that required revisions.

**Did We Accomplish the Mission?**

To close the loop on the initial design challenges identified at the outset of the Phase II course redesign, Table 2 summarizes how each issue was addressed through targeted instructional strategies and structural changes. These solutions reflect a deliberate application of performance-based design principles grounded in job task analysis and supported by learning science. The restructured Phase II course delivers a streamlined, mode-specific learning experience by aligning instructional sequencing, content relevance, and assessment strategies with operational expectations, accelerating trainee proficiency without extending training time.

**Table 2. Initial Design Challenges and Results**

| Guiding Question | Challenge | Redesign Strategy | Outcome |
|---|---|---|---|
| How can two proficiency levels be combined into one phase without extending the current training or adding additional training in the curriculum? | Legacy structure treated novice and post-novice training as separate phases. | Layered instructional blocks (Crawl-Walk-Run-Fly); embedded performance tasks; job-context design; front-loaded practice. | Novice and post-novice skills achieved within the existing timeframe; no added training required. |
| How can Phase II be designed where, upon completion of the training, TSIs can perform at a post-novice level? | Training focused heavily on theory; hands-on performance delayed until OJT. | Early introduction of mode-specific job-context scenarios; use of CPIs; scenario-based JKTs; mock facility practicum; metacognitive strategies | Trainees demonstrate decision-making, analysis, and compliance determination at a post-novice level by the end of Phase II. |
| How can three variations of the same complex job be taught without redundancies? | Trainees received all-mode instruction regardless of job assignment. | Multi-mode JTA; Common Core blocks for shared content; mode-specific tracks for targeted training in Block C. | Eliminates redundant instruction; trainees receive relevant, role-specific training. |
| How can the Phase II course cater better to TSIs assigned to specific modes? | Trainees were frustrated with irrelevant content; mode assignments not reflected in training. | Sequenced structure: Common Core (Blocks A and B) + Mode-Specific Tracks (Block C) + Compliance Practicum (Block D) | Trainees develop foundational and mode-relevant skills; training is personalized to their assigned role. |

The redesigned Phase II curriculum effectively addresses all four original design challenges through a streamlined, performance-based structure. By layering instruction and embedding applied tasks early in the learning experience, trainees achieve both novice and post-novice proficiency within the original training duration, thus eliminating the need for extended timelines or additional coursework. Job-context strategies, criterion-referenced assessments, and mode-specific practicums ensure that learners not only retain knowledge but also demonstrate decision-making and compliance evaluation skills in realistic scenarios. Redundancies were eliminated by restructuring the curriculum into shared core blocks and targeted mode-specific tracks, allowing each TSI to receive training aligned with their assigned operational role. The Integrated Performance-Based Method maximizes relevance, minimizes cognitive overload, and supports faster, more reliable job readiness across all three operational modes.

## NEXT STEPS

The new TSI curriculum structure has now been implemented for just a few months, and additional evaluations were not within the scope of the development effort. Further study should be conducted to determine if the new Phase II course redesign has a positive impact on job performance over time, specifically before and after Phase III OJT. A post-Phase II study is recommended to assess if TSI personnel who have completed the training portion of the program feel more prepared to tackle the job functions at OJT. A closer examination of their perception of performance readiness should be evaluated against the OJT performance checklist. Likewise, an additional study as a separate effort is recommended, preferably at least six months after the new curriculum implementation, to evaluate TSI personnel who have completed all three phases of the curriculum to determine if the new program has had a positive impact on the rate of security inspection findings of non-compliance and violations (Level 3), which supports TSA's goals to safeguard our transportation networks.

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