NDIA 14th Annual Systems Engineering Conference

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Commercial T&E Approach

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Overview

- **Customs and Border Protection mission**

- **Office of Technology Innovation and Acquisition (OTIA) mission**

- **Systems analysis**

- **Commercial test and evaluation approach**

CBP's Dual Missions

Security

- **Stop terrorism**
- **Prevent illegal entry**
- **Block drug & human smuggling**
- **Prevent agricultural disease**
- **Secure national events**
- **Assist with disaster relief**

Facilitation

- **Collect customs revenue**
- **Process incoming travelers**
- **Inspect imports**
- **Stop counterfeits**

Protecting the Border Is An Immense Job

Every day, CBP deploys more than 42,000 frontline personnel to protect nearly 7,000 miles of land border and 327 ports of entry.

In FY 2009, CBP processed $1.7 trillion in commercial imports.

Recent Border Protection Successes

- **361.2 million travelers inspected at ports of entry**
- **556,000 illegitimate entrants stopped along border**
- **224,000 inadmissible aliens turned away at ports of entry**
- **1.5 million prohibited animal or plant products kept out**
- **166,727 agricultural pests blocked**
- **39,000 suspected criminals arrested**
- **9,500 wanted criminals arrested**

FY 2009 data

Office of Technology Innovation and Acquisition (OTIA) Mission

- **Ensure all technology efforts are properly focused on mission and are well integrated across CBP**

- **Strengthening expertise and effectiveness in acquisition and program management of contractor-delivered products and services**

- **OTIA Assistant Commissioner will also serve as CBP's Component Acquisition Executive**

- **Serves as CBP's Component Acquisition Executive**
  - CBP Level 3 and DHS-delegated Level 1 and 2 programs
- **Authority to review and approve key acquisition decisions**
- **Represent CBP on Acquisition Review Boards (ARBs) for Level 1 and 2 programs**
- **Provide oversight that all programs progress through the Acquisition Review Process**
  - Level 1, 2 & 3
  - Other CBP acquisitions
  - IT and non IT programs

OTIA Acquisition Focus

- **Rapid fielding of capability to CBP officers and agents**

- **Complex developmental systems not current focus for OTIA procurement – longer term option**

- **Immediate focus on commercial procurement items**
  - COTS, GOTS, NDI systems greatly preferred
  - Fielding systems that work quickly and affordably
  - Capabilities based
  - Vendor integration

CBP Technology Interest Areas*

- **Common operating pictures**

- **Ultra-light detection**

- **Tunnel detection**

- **Wide-area surveillance**

- **Open Architecture**

- **Broadband/wireless**

- **Radiation Portal Monitors**

- **Chemical identification**

- **Improved UGS**

- **High resolution cameras**

- **Predictive intelligence**

- **Automated target recognition**

- **Insider threat detection**

- **Foliage penetration**

- **IP-addressable sensors**

- **Synthetic aperture radars**

*Not a comprehensive list

System Analysis Application

Systems Analysis

Commercial/NDI Elements

- SELC Activities
- T&E Approach
- Support
- Risk Management
- CM
- PMP
- LCCE, etc.

Adapted Commercial/NDI Elements

- SELC Activities
- T&E Approach
- Support
- Risk Management
- CM
- PMP
- LCCE, etc.

Development Elements

- SELC Activities
- T&E Approach
- Support
- Risk Management
- CM
- PMP
- LCCE, etc.

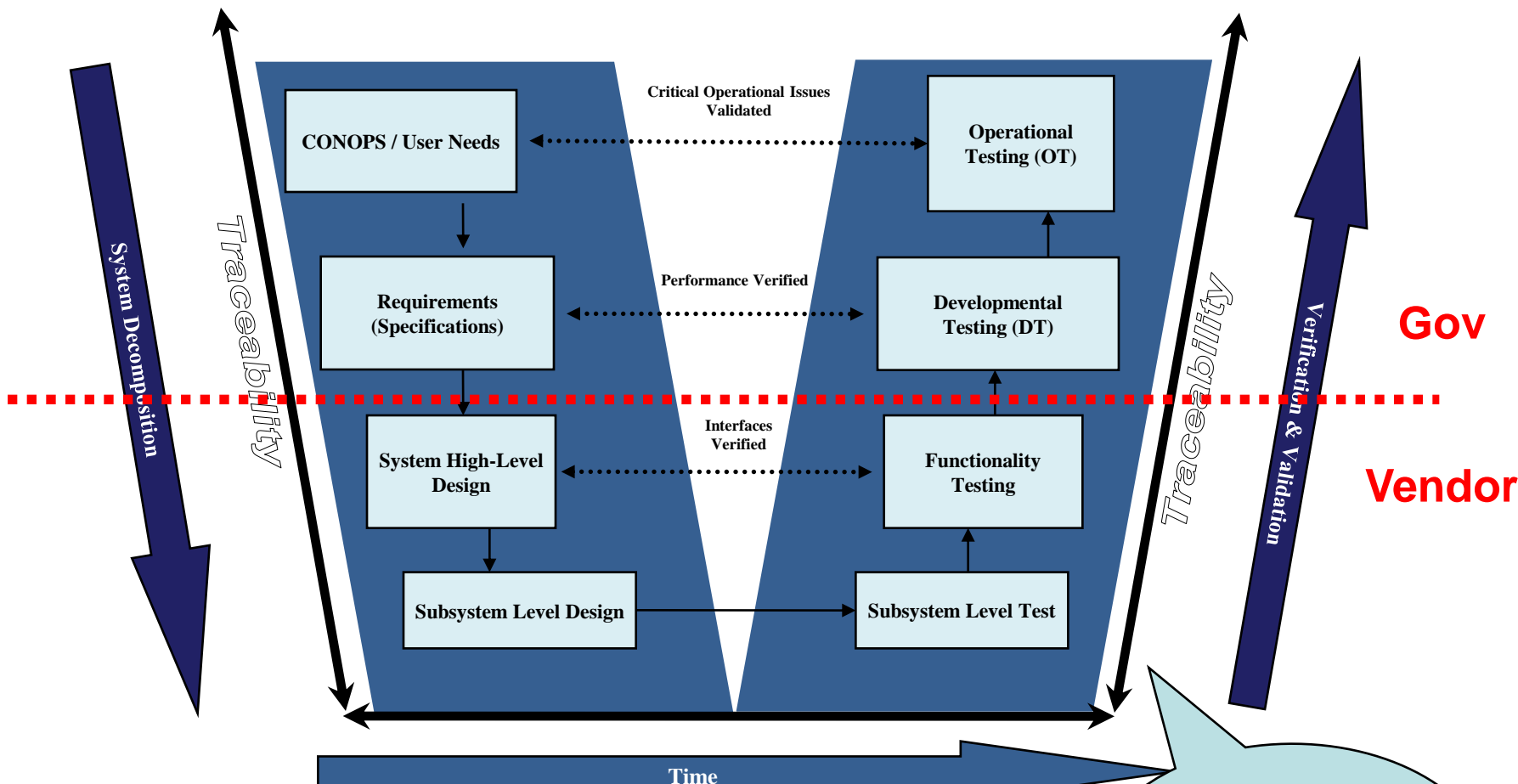**System Acquisition Proposed Approach**

System Acquisition Decision

System Acquisition

Least Complex / Most Programs   **Most Complex / Few Programs**

Systems Engineering 'V'

Critical Operational Issues Validated

CONOPS / User Needs ↔ Operational Testing (OT)

Performance Verified

Requirements (Specifications) ↔ Developmental Testing (DT)

Interfaces Verified

System High-Level Design ↔ Functionality Testing

Subsystem Level Design → Subsystem Level Test

System Decomposition

Traceability

Traceability

Verification & Validation

Gov

Vendor

Time

Vee is still applied for commercial products

MNS – Mission Needs Statement
CONOPS – Concept of Operations
ORD – Operational Requirements Document
FRD - Functional Requirements Document
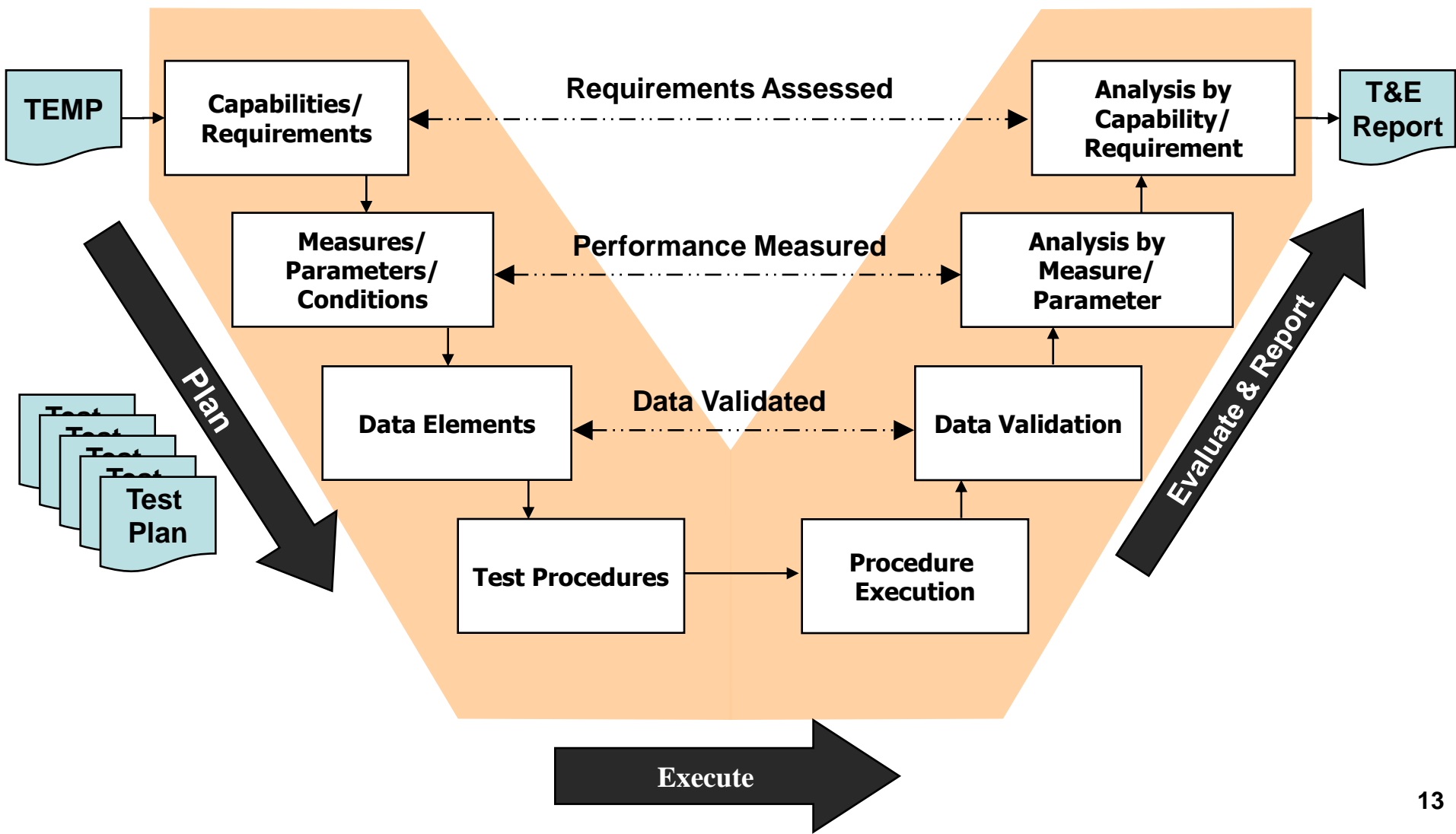**SRD** – System Requirements Document

RTM – Requirements Traceability Matrix
SRTM – Security Requirements Traceability Matrix
IRS – Interface Requirements Specification
ICD – Interface Control Document
SSS – System/Sub-System Specification
SRS – Software Requirements Specification

The T&E 'V' Process
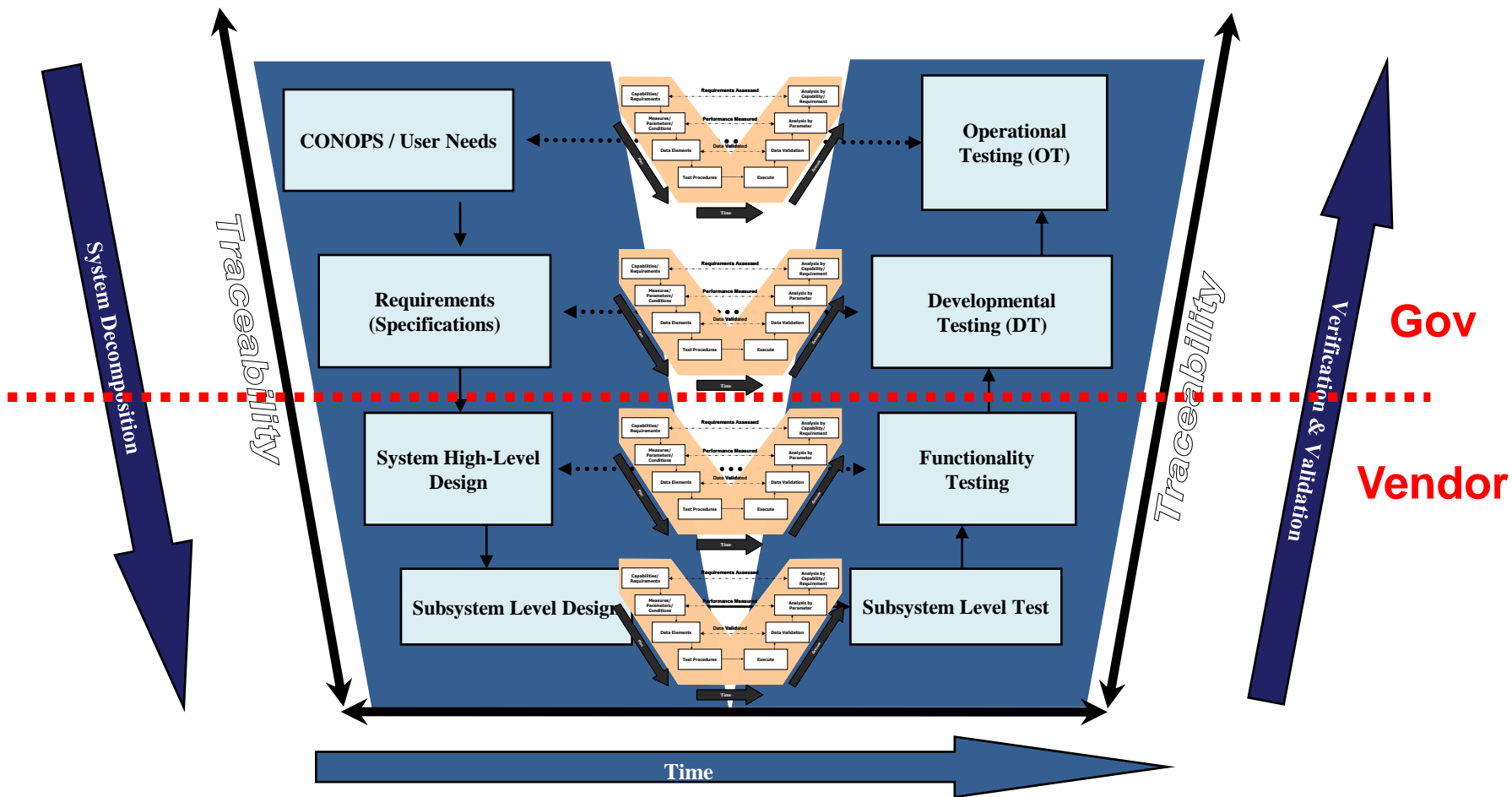
T&E 'V' – Implemented at Every Level of SE 'V'

- **Vendor Interface**
  - Explicit T&E scope, expectations and roles outlines in RFPs
  - Close interface with vendors and vendor testing
  - Synergy in government witnessed contractor testing
  - System Qualification Tests typically based on vendor stated capability vice firm government requirements
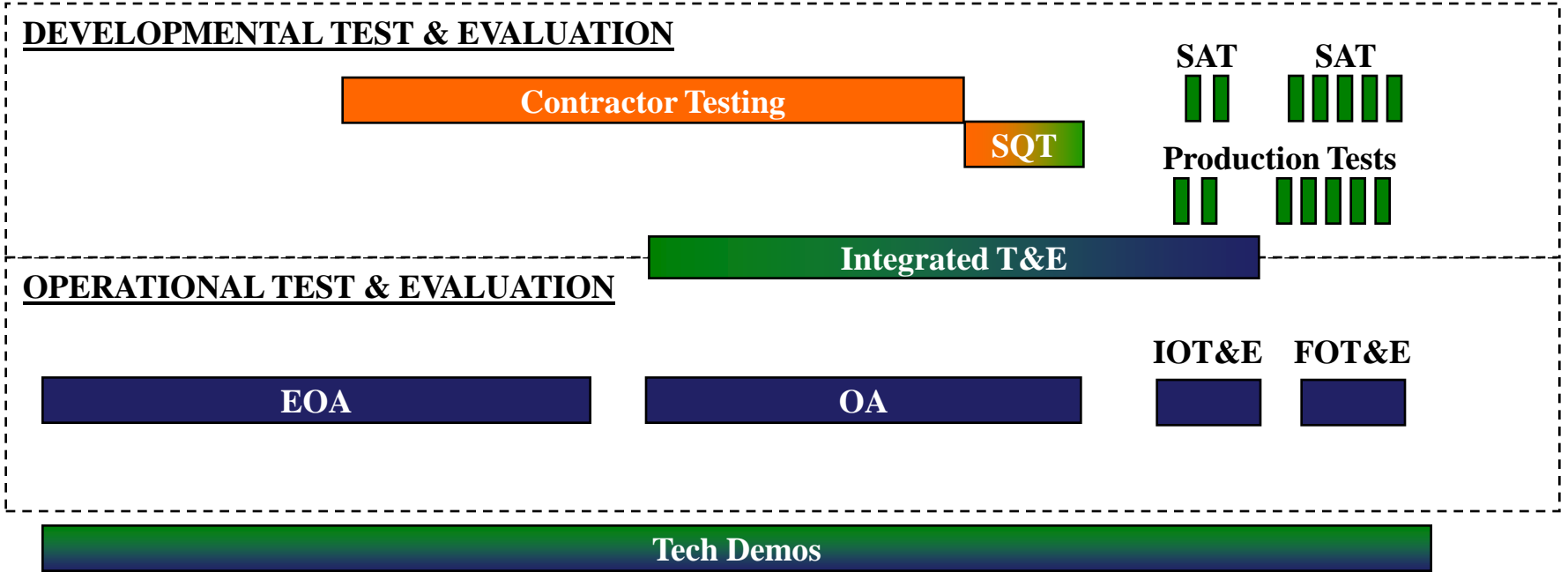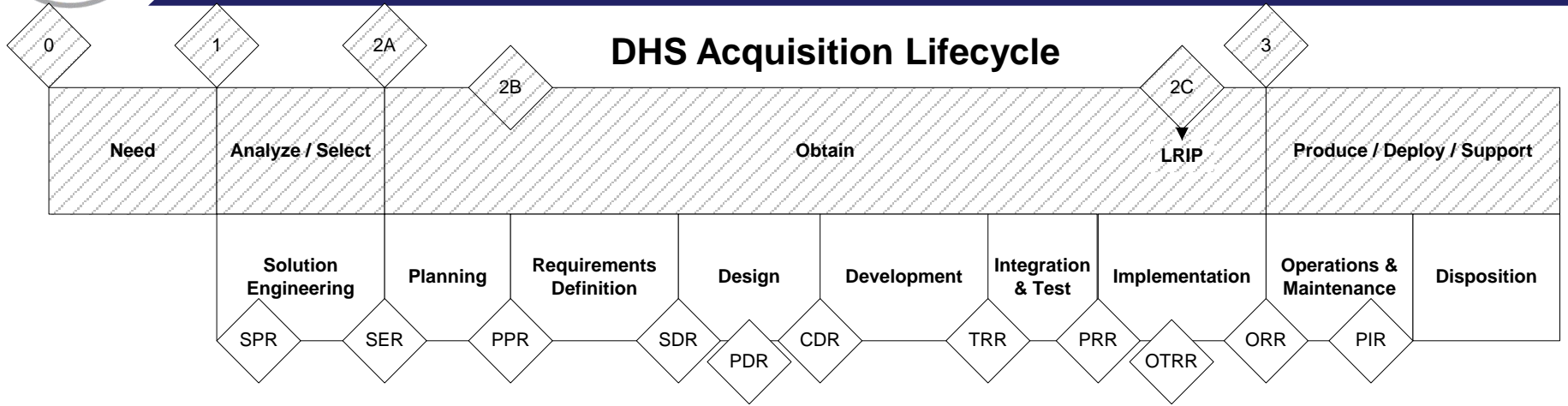 - Tightly coupled following contractor testing

- **User Interface**
  - SAT integrated with OT for cost, schedule and performance gains

Agile T&E process

Testing Synergy

DHS Acquisition Lifecycle

0	1	2A		3	

2B   2C

Need   **Analyze / Select**   **Obtain**   **LRIP**   **Produce / Deploy / Support**

Solution Engineering	Planning	Requirements Definition	Design	Development	Integration & Test	Implementation	Operations & Maintenance	Disposition

SPR   SER   PPR   SDR   PDR   CDR   TRR   PRR   OTRR   ORR   PIR

DEVELOPMENTAL TEST & EVALUATION

SAT   SAT

Contractor Testing

SQT

Production Tests

Integrated T&E

OPERATIONAL TEST & EVALUATION

IOT&E   FOT&E

EOA   **OA**

Tech Demos

Technical Focus (vendor)   **Technical Focus (gov)**   **Operational Focus (gov)**

- **Potential for multiple vendor selections**
  - Different down-selected vendor approaches
  - Same requested capability

- **Conditions, planning, procedures, analysis vary vendor to vendor**

- **Understanding the system under test**

- **Lack of understanding of test capabilities of vendors**

- **Lack of insight into vendor capabilities early in the acquisition process**

Fidelity of T&E scope and definition in the RFP is critical with commercial procurement focus

Commercial T&E Optimization

- **Developed T&E RFI Questions Guide**
  - Focused Market Research on vendor commercial testing history, capabilities, and environments
- **Developed T&E RFP Questions Guide**
  - Vendor to define their commercial capabilities and T&E strategy, integration, execution
  - Enabler for PM to optimized AS & IMS for multiple vendors
- **Developed TEMP Review Guidebook**
  - Focused review on the critical commercial T&E, acceptance testing, qualification testing, and interfaces with vendor(s) and OT
- **Developed Test Plan Template**
  - Allows flexible inputs that accommodates commercial T&E practices as lead or as oversight
- **Early demonstrations (bid sample) of vendor systems prior to acquisition**
- **Early user inputs to T&E and user input to programmatic decisions**

- **OTIA provides end-to-end test event planning/review process for all OTIA programs**

- **Process includes lines of responsibility and periodic gate reviews with entrance and exit criteria to ensure proposed and planned tests successfully progress**

- **Process may be tailored for individual test events**

- **Supports DHS Acquisition Directive 102-01**

- **Process is repeatable, adaptable, and scalable**

Enclose in RFP -- ensures linkage of Test Events

Test Event Planning/Executing/Analysis & Reporting

Scalable   **Repeatable**   **Tailorable**

Plan	Execute	Report

Test Event Initiation	Initial Test Development	Interim Review	FINAL TRR	Quick Look Brief	Final Report
TEGR 0	TEGR 1	TEGR 2	TEGR 3	TEGR 4	TEGR 5

Reqmts, TEMP, SELC & AP Artifacts
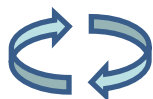
Test Plan   Test Procedures   DMAP

TORs

TR

Test Event Execution Planning

Functions
- Develop
- Test and Analysis Concepts
- Data Collection, Qualification, Archival and Release Processes
- Test Schedule

Test Event Execution

Functions
- Execute Test Procedures
- Record Test Observation Reports (TORs)

Analyses & Reporting

Functions
- Data Validity
- Execute Analysis Plan
- Prepare Quick Look Briefing
- Prepare Test Report

Legend
AP=Acq Plan
DA=Data Analyst
PM=Program Mgr
SELC=Sys Eng Life Cycle
TD=Test Director
TEGR=Tst Evt Gate Rev
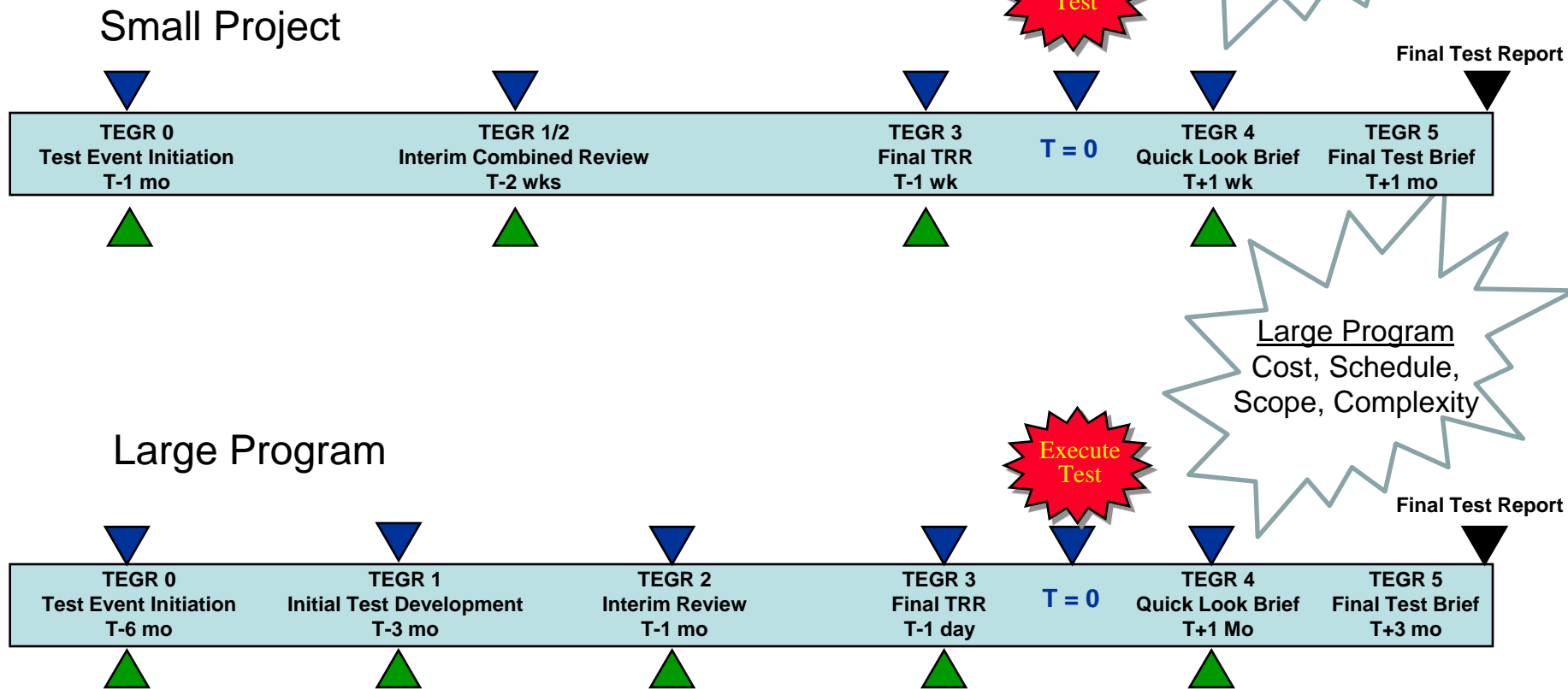TEMP=Tst & Eval Mstr Plan
TOR=Test Observation Rpt

Data

TORS

Daily Status Reports

PM Briefs   **TD Briefs**   **TD Briefs**   **TD Briefs**   **DA Briefs**   **DA Briefs**

OTIA T&E: Tailorable / Scalable

Small Program
Cost, Schedule, Scope, Complexity

Large Program
Cost, Schedule, Scope, Complexity

Execute Test

Small Project

TEGR 0	TEGR 1/2	TEGR 3	T = 0	TEGR 4	TEGR 5
Test Event Initiation	Interim Combined Review	Final TRR		Quick Look Brief	Final Test Brief
T-1 mo	T-2 wks	T-1 wk		T+1 wk	T+1 mo

Final Test Report

Large Program

TEGR 0	TEGR 1	TEGR 2	TEGR 3	T = 0	TEGR 4	TEGR 5
Test Event Initiation	Initial Test Development	Interim Review	Final TRR		Quick Look Brief	Final Test Brief
T-6 mo	T-3 mo	T-1 mo	T-1 day		T+1 Mo	T+3 mo

Final Test Report

Time line is scalable   Gate Reviews are tailorable   Process is repeatable

Conclusions

- **DHS is leveraging commercial acquisition approach to balance cost and schedule while maintaining critical capabilities**

- **SE is using agile systems analysis approach to focus engineering efforts on key areas**

- **DT&E is gaining synergy with vendors and Operational testing to improve:**

  - Speed, scope, and completeness

  - Quality to program office decisions and capability to the Border Patrol

- **Aggressively pursuing artifacts and processes to improve commercial-based T&E for CBP**

Questions

- **OTIA acquires systems that are comprised of elements that may be commercially sourced or may require development**
  - Commercial/Non-Developmental Item (Coml/NDI)
  - Adapted (from Coml/NDI)
  - Development
- **Acquisition, technical and business approaches and insights differ for each system element type**
  - Coml/NDI – no design, no development, acceptance testing, vendor CM, and high cost certainty
  - Adapted – no design, ECP, limited DT, vendor CM, and medium cost certainty
  - Development – design, development, integration, test, full CM, and low cost certainty

One Size Does Not Fit All

Trade Security

- **108.5 million conveyance vehicles inspected**
- **56,000 foreign examinations of cargo**
- **2,500 security validations in 90 countries**

FY 2009 data

Drug Seizures

- **1.5 million pounds of drugs seized at ports of entry**
- **1.3 million pounds of marijuana and cocaine seized by Air and Marine agents**
- **Significant increases over FY 2008:**
  - Heroine seizures rose 316% along the border
  - Cocaine seizures rose 53% at ports of entry, 18% along the border
  - Marijuana seizures rose 19% at ports of entry, 58% along the border

*FY 2009 data; *measured by kilos of weight seized*