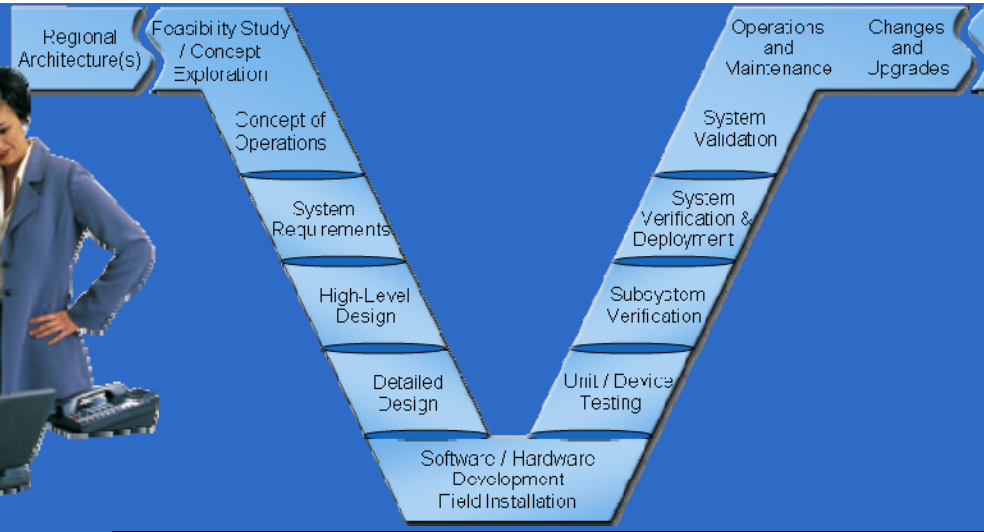


Welcome and Introductions

Process Overview

Systems Engineering "V"

Cross-Cutting Activities

Applying SE to a Project

Establishing SE in your Organization

Process Improvement Discussion

Wrap Up

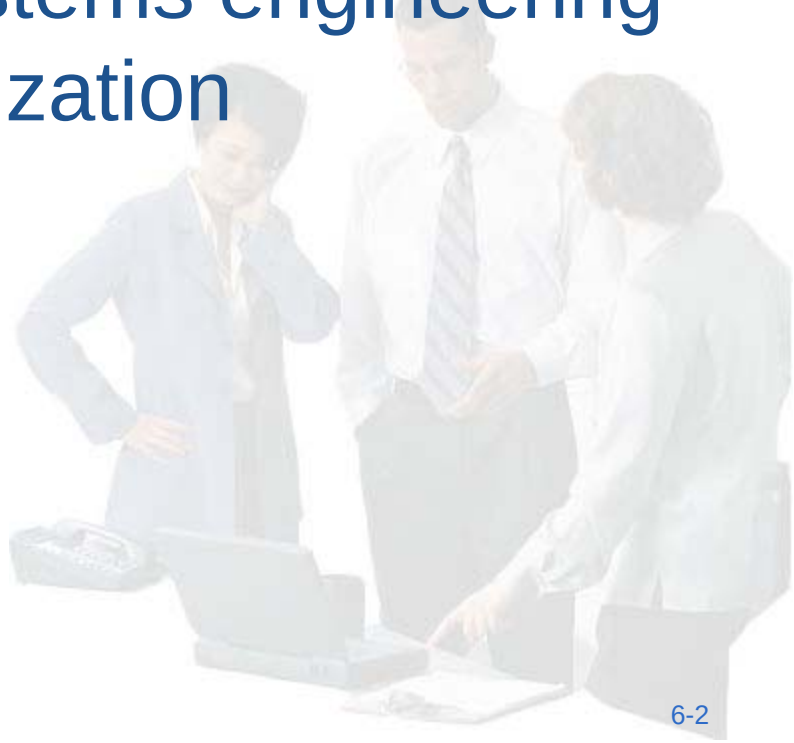
Session 6: Establishing SE in Your Organization

These materials developed under the RITA National ITS Architecture Program

U.S. Department of Transportation
Research and Innovative Technology Administration

Learning Outcomes

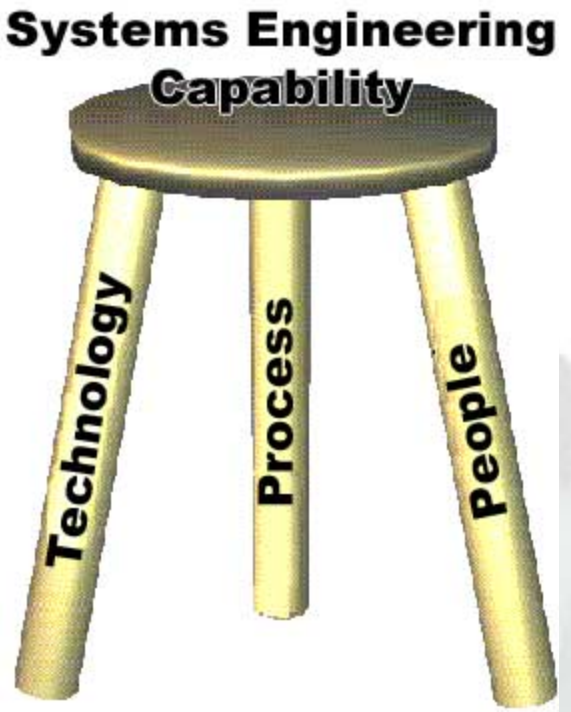
- Identify ways to improve systems engineering capabilities
- List steps to establish systems engineering processes for your organization



Improving Systems Engineering Capability

Three aspects should be addressed:

- People – Build systems engineering knowledge
- Process – Establish systems engineering processes for your organization
- Technology – Use SE Tools to make the processes more efficient and effective



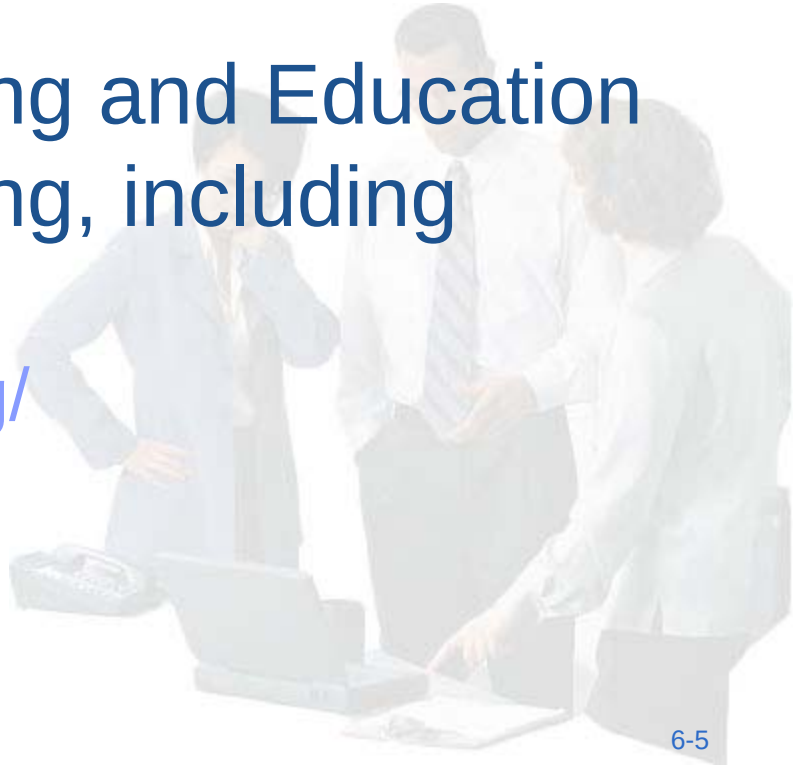
Building Systems Engineering Knowledge

People

- Identify systems engineering specialists in your organization
  - Don’t overlook the Information Technology Group
- Provide staff training opportunities
  - Can use 100% federal funds from a project to pay for any training
- Hire experienced SE consultants
  - Still need SE skills within your organization

Training

- National Highway Institute (NHI -- mostly classroom-based courses)
  http://www.nhi.fhwa.dot.gov/training/down_catalog.aspx
- Consortium for ITS Training and Education (CITE -- web-based training, including "blended learning")
  http://www.citeconsortium.org/



SE Training

People

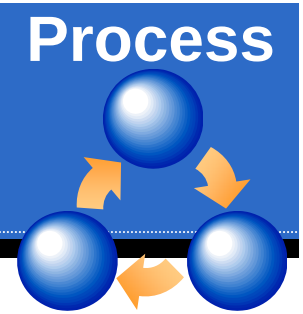
- Introductory
  - Introduction to SE for Advanced Transportation
    NHI Course #137024 and CITE
  - Managing High Technology Projects in Transportation
    NHI Course #137026 and CITE
- Intermediate
  - Software Acquisition for ITS Projects
    NHI Course #137019 and CITE
  - Procurement for ITS Projects
    NHI Course #137020 and CITE
- Advanced
  - Advanced SE for Advanced Transportation Projects
    CITE
  - Configuration Management for Traffic Management Systems
    NHI Course #137042 and CITE

Related ITS Training

People

- Introduction to the National ITS Architecture
  NHI Course #137013 and CITE
- Advancing Transportation System Management and Operations
  NHI Course #133098
- Improving Highway Safety with ITS
  NHI Course #137044
- Turbo Architecture Software Training
  NHI Course #137029A
  NHI Course #137048 (Web Based)

CMMI Capability Levels are a Proven Process Improvement Approach



5 Focus on process improvement

4 Process measured and controlled

3 Process characterized for the **organization** and is proactive

2 Process characterized for **projects** and is often reactive

1 Competent people and heroics (Hope for the best)

Optimizing

Quantitatively Managed

Defined

Managed

Performed

Process Improvement Recommendations

Process

- Pilot SE processes on projects – begin with SE "V" Model
- Leverage parallels in processes
  - SE
  - Capital Projects
  - IT
- Improve cross-cutting capabilities – Project Mgmt, Risk Mgmt, Configuration Mgmt
- Establish policies, document SE process
- Implement across organization

Systems Engineering Tools

Tools

- Establish SE library (e.g., templates, best practices, decision support tools)
- Consider range of SE tools as organization gains experience
  - Project Management
  - Requirements Management
  - Systems Architecture
  - Testing/Problem Tracking
  - etc., etc.
- Use complex tools based on project need

SE Resources

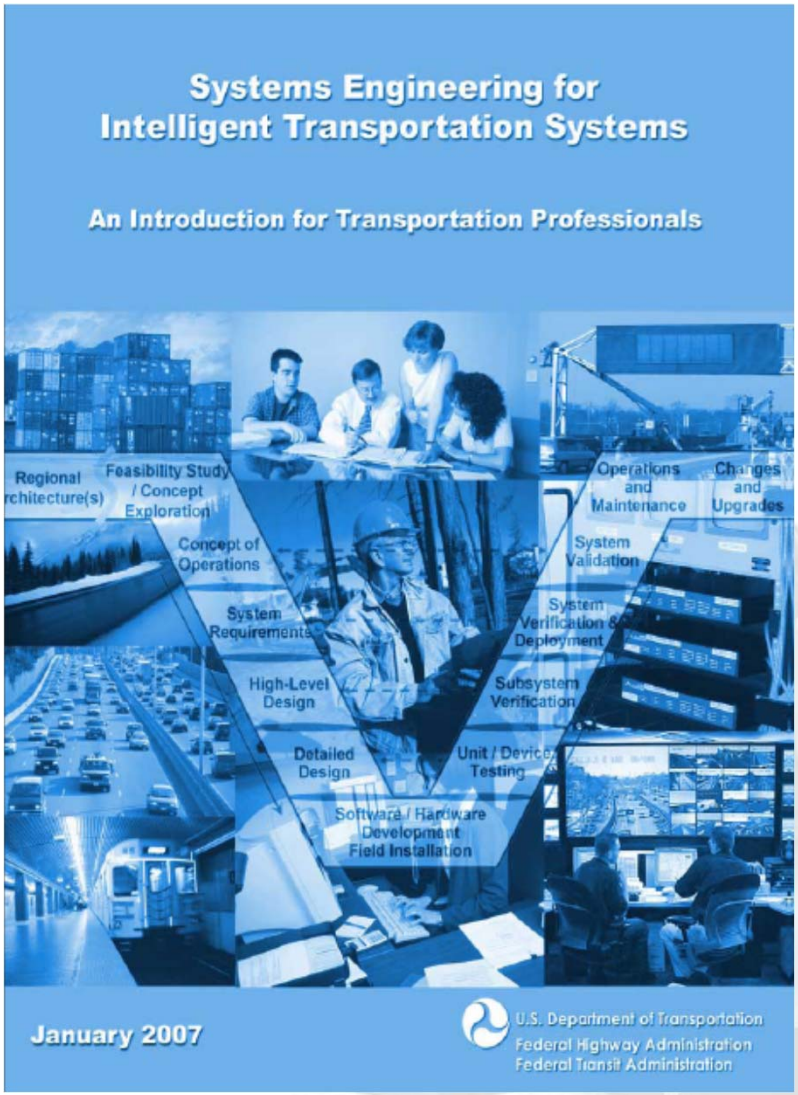
- Systems Engineering Handbook
- Systems Engineering Guidebook
- Guide to Contracting ITS
- Lessons Learned Database
- Comprehensive list of resources included in your workbook

Systems Engineering Handbook

On-Line at:

http://ops.fhwa.dot.gov/publications/seitsguide/index.htm

CD in your workbook



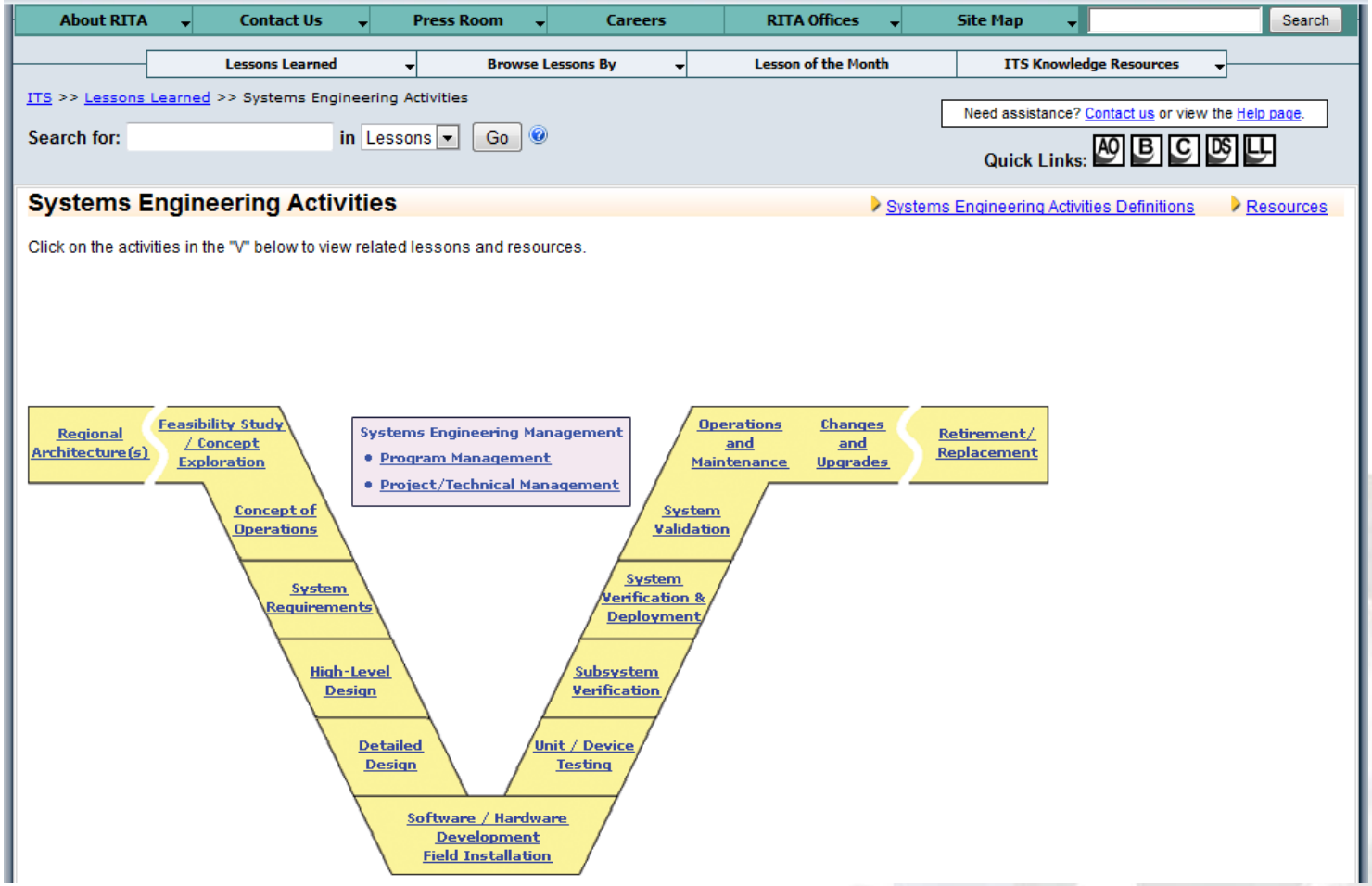
Systems Engineering Guidebook

http://www.fhwa.dot.gov/cadiv/segb/

Choosing the Right Contracting Approach

http://www.citeconsortium.org/Model/index.htm

Lessons Learned Database



http://www.itslessons.its.dot.gov/its/benecost.nsf/LessonSystemsEng

Review Learning Outcomes

- Identify ways to improve systems engineering capabilities
- List steps to take to establish systems engineering processes for your organization