Session 6: Establishing SE in Your Organization

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

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
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
- 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
- National Highway Institute (NHI -- mostly classroom-based courses)

- Consortium for ITS Training and Education (CITE -- web-based training, including “blended learning”) 
  http://www.citeconsortium.org/
SE Training

- **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

- 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

1. Competent people and heroics (Hope for the best)
2. Process characterized for projects and is often reactive
3. Process characterized for the organization and is proactive
4. Process measured and controlled
5. Focus on process improvement

- Performed
- Managed
- Defined
- Quantitatively Managed
- Optimizing
Process Improvement Recommendations

- 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
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
On-Line at:


CD in your workbook
Welcome

Welcome to Version 3.0 of the Systems Engineering Guidebook for ITS Web Site. Co-sponsored by the Federal Highway Administration and the California Department of Transportation, this web site provides quick and easy access to information that will help you intelligently apply systems engineering to your Intelligent Transportation Systems projects. This resource is the culmination of decades of experience in applying these processes and capabilities in ITS and other industries. We are eager to add your lessons learned and experience in a continuing effort to provide a quality, relevant resource for ITS practitioners. Please send us your feedback.

- What is Systems Engineering?
- Why Use Systems Engineering on Your Project?
- Key Systems Engineering Principles

SE Guidebook Views

The Systems Engineering Guidebook content can be accessed through seven different views. Select the view on the right that best suits your needs.

http://www.fhwa.dot.gov/cadiv/segb/
Choosing the Right Contracting Approach

National Cooperative Highway Research Program (NCHRP)

NCHRP Project 03-77: Guide to Contracting ITS

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