

- 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



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:

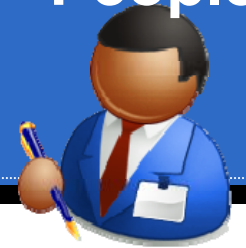
- People – Build systems engineering knowledge
- Process – Establish systems engineering processes for your organization
- Technology – Use SE Tools to make the processes more efficient and effective





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



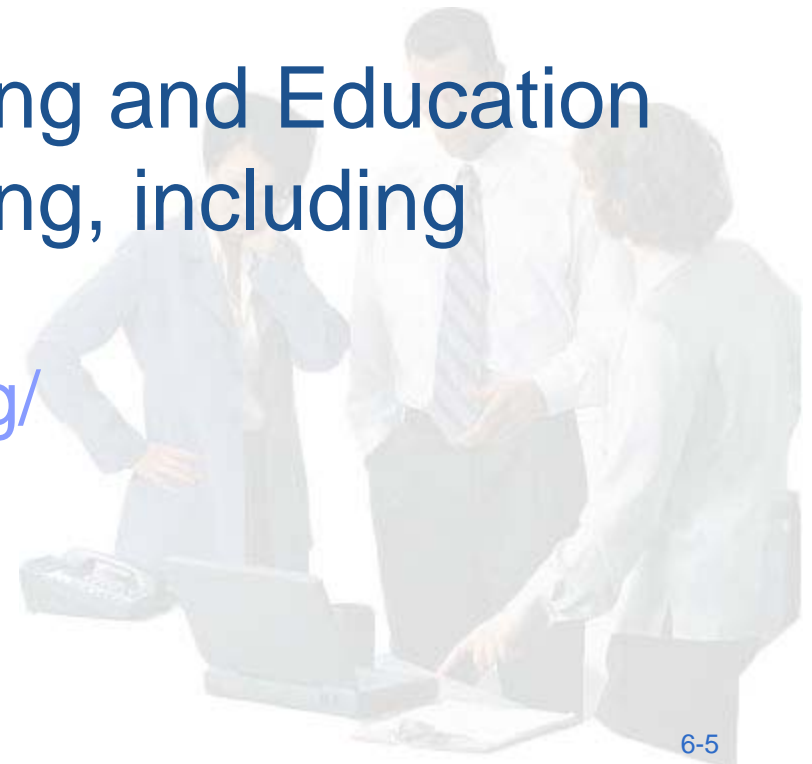


Training

People



- 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

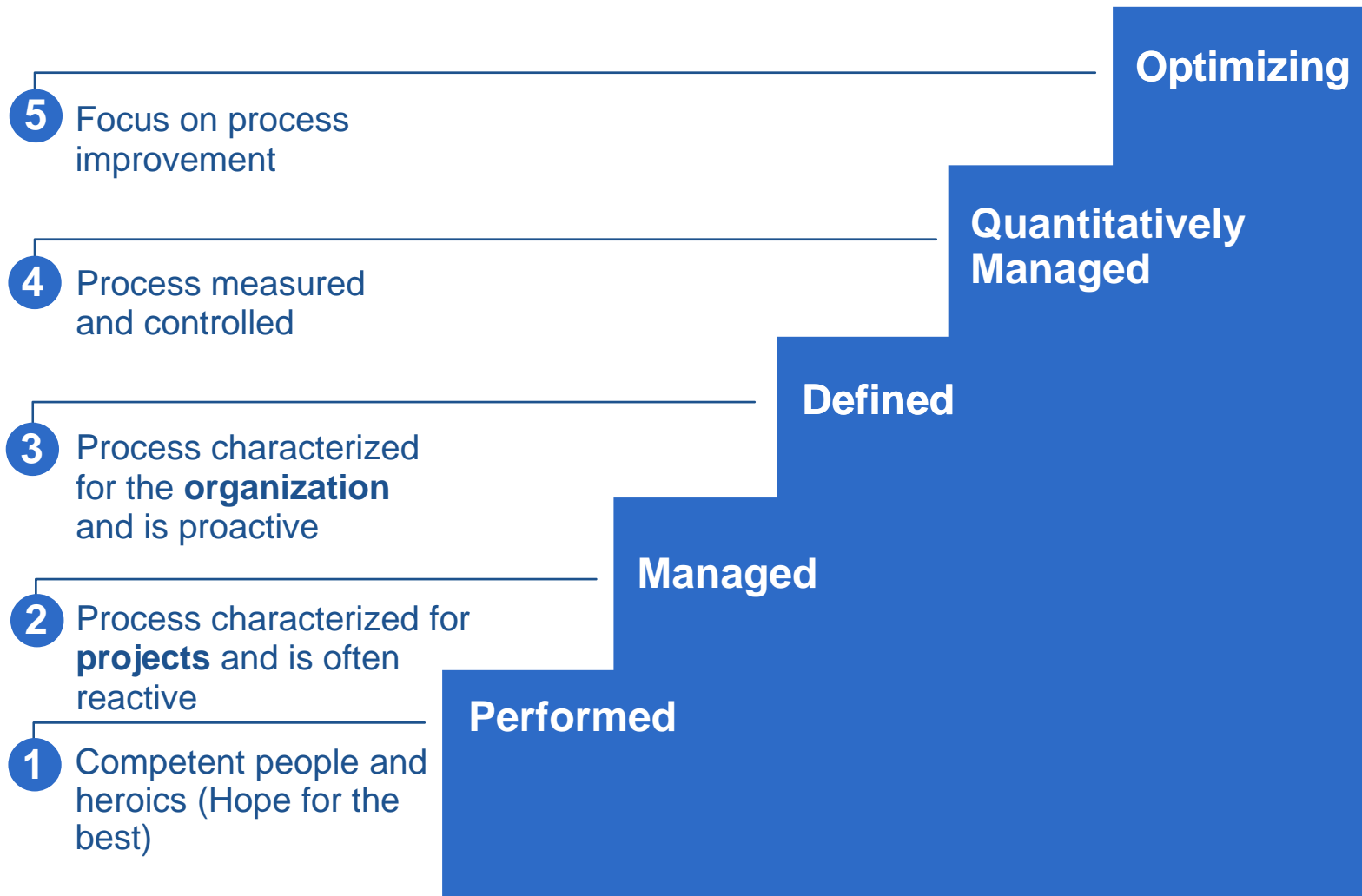
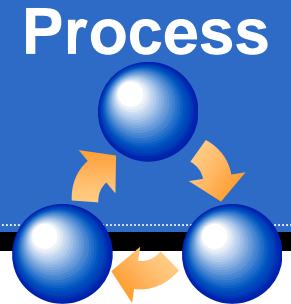


- Introduction to the National ITS Architecture
NHI Course #137013 and CITE
- Advancing Transportation System Management
and Operations
NHI Course #133098
- Improving Highway Safety with ITS
NHI Course #137044
- Turbo Architecture Software Training
NHI Course #137029A
NHI Course #137048 (Web Based)





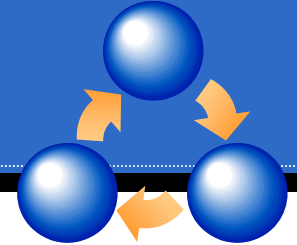
CMMI Capability Levels are a Proven Process Improvement Approach





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



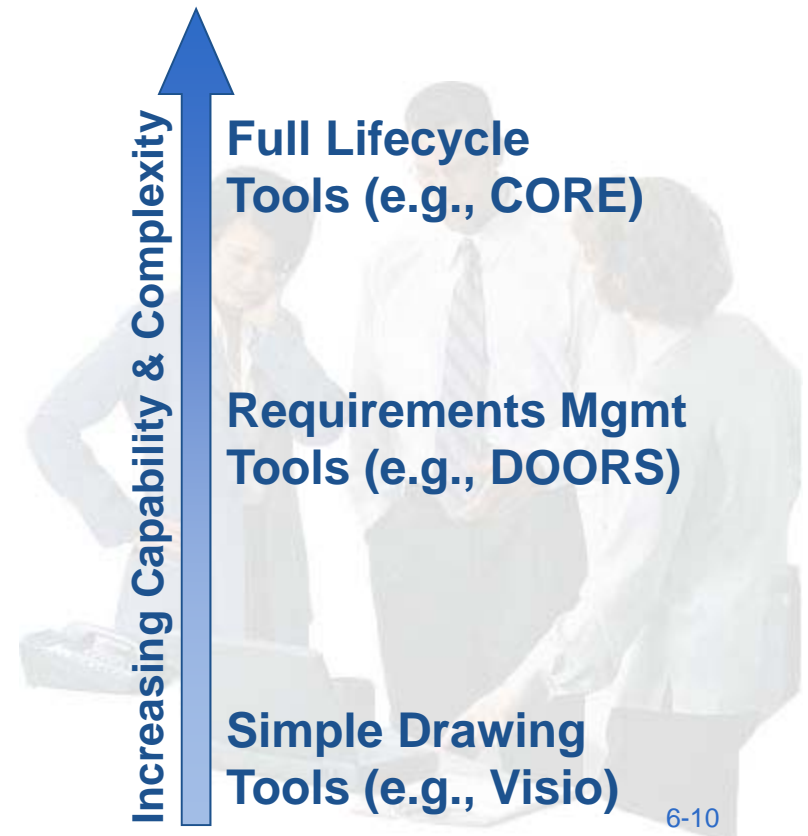


Systems Engineering Tools

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



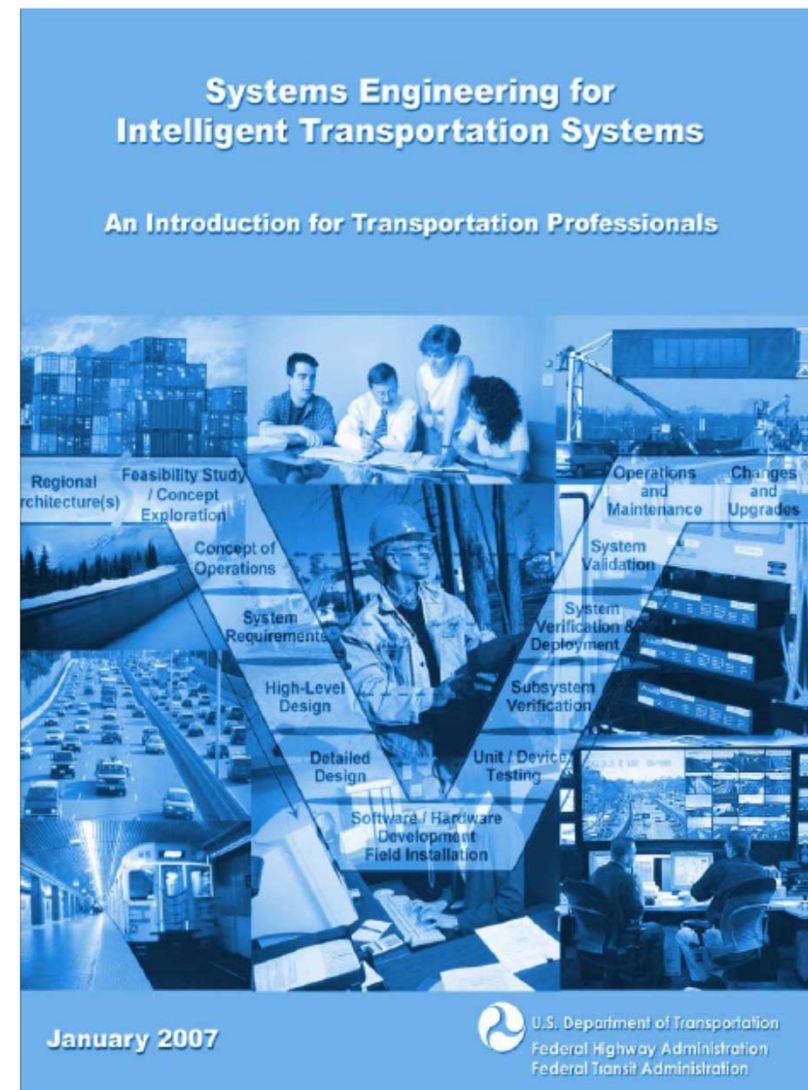


Systems Engineering Handbook

On-Line at:

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

CD in your workbook





Systems Engineering Guidebook

U.S. Department of Transportation
Federal Highway Administration

FHWA Home | Feedback

HOME WHAT'S NEW VIEWS SEARCH GLOSSARY RESOURCES FEEDBACK SITE MAP

Welcome to the Systems Engineering Guidebook for ITS

Challenges Lifecycle Tasks Version 3.0 Solutions

Programmatic Decisions, Change Requirements, System Requirements, System Architecture, System Integration, System Verification, System Validation, System Acceptance, System Maintenance, System Support, System Upgrade, System Replacement, System Decommission

FHWA CA Division
Caltrans

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](#)

Testimonials



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.

Views

[Process](#) 

[Deliverable](#) 

[Example](#) 

[Checklist](#) 

[Capability](#) 

[Role](#) 

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



Choosing the Right Contracting Approach

National Cooperative Highway Research Program (NCHRP)

**Edwards
AND
Kelcey**

ENGINEERS
ARCHITECTS
PLANNERS
CONSTRUCTORS



Documentation

Web-Based
Decision Model

NCHRP Project 03-77: Guide to Contracting ITS

Credits

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



Lessons Learned Database

Navigation: About RITA | Contact Us | Press Room | Careers | RITA Offices | Site Map | Search

Lessons Learned | Browse Lessons By | Lesson of the Month | ITS Knowledge Resources

ITS >> [Lessons Learned](#) >> Systems Engineering Activities

Search for: in Lessons

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

Systems Engineering Activities

[Systems Engineering Activities Definitions](#) | [Resources](#)

Click on the activities in the "V" below to view related lessons and resources.

Systems Engineering Management

- Program Management
- Project/Technical Management

Operations and Maintenance | **Changes and Upgrades** | **Retirement/Replacement**

<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

