

# 2015 FRA Rail Program Delivery



## FRA Expectations for Preliminary Engineering

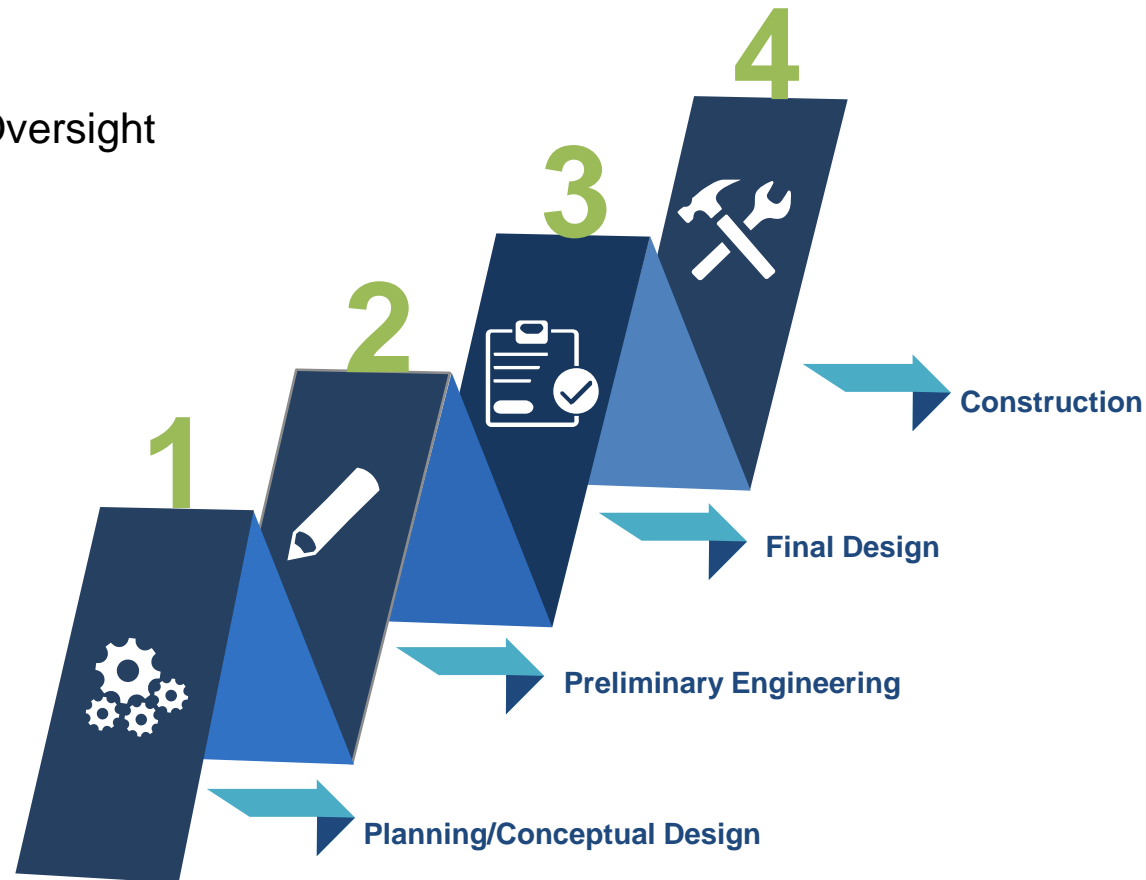
Leonard R. Evans, P.E.



# Overview of FRA Engineering Lifecycle

The FRA lifecycle establishes activities and milestones necessary for approval and advancement. FRA's engineering phased process for program delivery includes:

- Planning/Conceptual Design (CE)
- Preliminary Engineering (PE)
- Final Design
- Construction
- Monitoring and Oversight



# Engineering and Project Development Phases



## Planning and Conceptual Design

The purpose of planning is to develop a strategic plan for rail traffic through a given territory or corridor while maintaining an efficient level of service. The key activities for planning are:

- Alternative Analysis Reports,
- Feasibility Studies,
- Conceptual Engineering Plans,
- Specifications and Estimates,

## Preliminary Engineering

The purpose of preliminary engineering is to set preliminary line, grade, and width, regardless of project scope and complexity. The key activities for preliminary engineering are:

- Develop survey and mapping for preliminary engineering and environmental activities
- Develop preliminary design criteria for each alternative being considered
- Develop proposed track structures options
- Develop resourcing mapping and identify potential impacts of each alternative.

# Engineering and Project Development Phases



## Final Design

The purpose of final design is to finalize other special design considerations/ commitments agreed to during the Preliminary Engineering and NEPA Decision in the project's final design for construction. Final Design consists of the following seven interrelated components:

### Main Path

- Design Development
- Plan Preparation
- Contract Management

## Construction

The Construction Plan includes:

- Independent Verification and Validation
- Construction Inspection including Materials Testing Procedures
- Site Logistics Plan including Maintenance of Traffic/Ops
- Coordination with Third Parties affected by construction

# Elements of PE Engineering

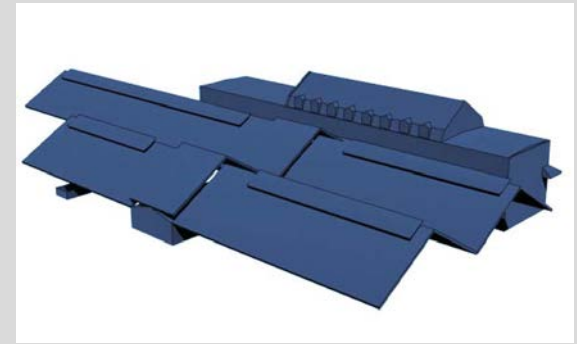
Initial Conditions,  
Surveys and  
Mapping

FRA assists in confirming plans and procedures are consistent with design criteria, and site surveys are complete and adequate.



Basis of Design,  
Criteria and  
Specifications

In the Basis of Design (BOD) phase, the project conceptual design is developed. The level of design completion for this phase typically is typically 15 percent and includes the schematic design.



Proposed Track  
Configurations

Proposed track charts should be drawn to an appropriate linear scale for the level of complexity of the track configuration in a particular segment.



# Elements and Outputs of Engineering

## Route and Aspect Chart

Route and Aspect charts contain the requirements and responsibilities of the railroad projects ability to implement appliances, devices, methods, or systems to function within the project area.

	9.60 RESTRICTING	Proceed at restricted speed.
	9.61 STOP AND PROCEED	Stop, then proceed at restricted speed.
	9.62 STOP	Stop.

Todd Sestero

## Revised Cost Estimates

Cost estimates should be supported by a detailed description of the methodology and assumptions used in developing the estimates including values and sources of unit costs for labor, materials, and equipment; overhead costs or other additives; allocated and unallocated contingencies; and cost escalation factors.



## Staging Plan

A proper staging plan includes adequate areas for construction access and material storage but also sustains access during various elements of construction. This could include temporary elements to maintain rail operations and include a sequence to avoid shutting down operating railroads during construction, a shoo fly.



# Other Considerations

During the Preliminary Engineering process, all considerations beyond scope, budget and schedule needs to be considered by the Grantee.

**1** **Safety**

**2** **Environmental**

**3** **Buy America**

**4** **American Disabilities Act**



# FRA Approvals and Acceptance

The FRA lifecycle establishes activities and milestones necessary for approval and advancement. FRA's engineering phased process for program delivery includes:

## PE Signatures and Approval

- FRA reviews and approves PE drawings (plan sheets), specifications, studies, reports, plats, maps, and other engineering and surveying work products
- A cover sheet is signed by the FRA Chief Engineer, and senior executives with signatory authority from all stakeholders

## Final Design Acceptance

- FRA assess whether the Grantee's project management approach is suitable to carry the project through bid, award, construction, and into revenue operations.





# FRA Engineering Snapshot Statistics

FRA is a critical part of the delivery process and has an active part in the grantee's delivery of a project.

**38** Ongoing PE projects currently being monitored.

**4** Weeks that a grantee can expect FRA to review PE .

**104** Ongoing FD projects currently being monitored.

**2** Weeks that a grantee can expect FRA to review FD.

# Additional Questions

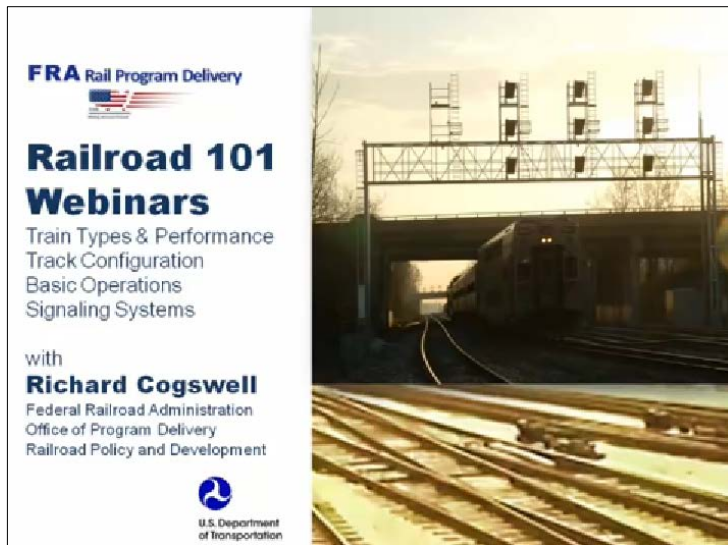
Leonard R. Evans, P.E.

[Leonard.Evans@dot.gov](mailto:Leonard.Evans@dot.gov)

See FRA web:

**Rail Network Development / Oversight Guidance / RR101 Webinars**

or <https://www.fra.dot.gov/Page/P0797>



**FRA** Rail Program Delivery

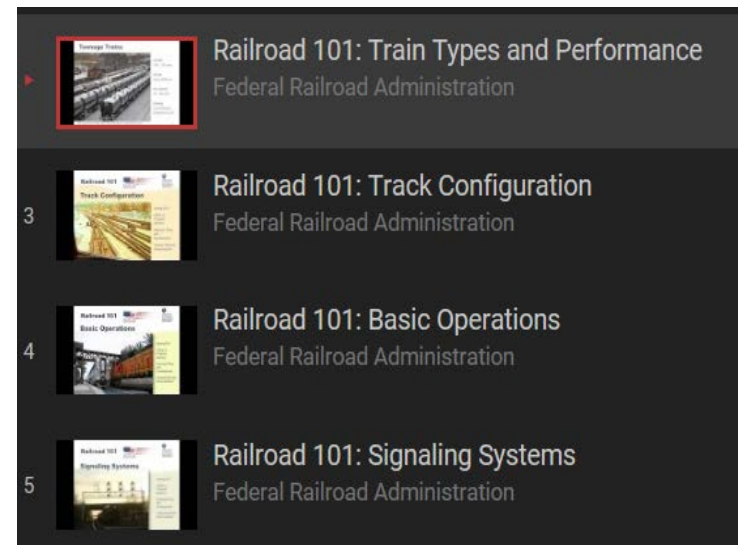
**Railroad 101 Webinars**





Train Types & Performance  
Track Configuration  
Basic Operations  
Signaling Systems

with  
**Richard Cogswell**  
Federal Railroad Administration  
Office of Program Delivery  
Railroad Policy and Development

U.S. Department of Transportation

The graphic features a photograph of a train passing through a bridge structure over tracks.



- 1  Railroad 101: Train Types and Performance  
Federal Railroad Administration
- 3  Railroad 101: Track Configuration  
Federal Railroad Administration
- 4  Railroad 101: Basic Operations  
Federal Railroad Administration
- 5  Railroad 101: Signaling Systems  
Federal Railroad Administration