



Engineering Analysis in PD&E Studies

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Presentation Outline

Engineering Analysis Procedure

Traffic Analysis Procedure

Changes in Transit Procedure

Overview of PD&E Manual Revisions

Part 2, Chapter 6

- Undergone major revisions/rewrites
- Separated **Process** from **Analysis**
 - Process now in Part 1, Chapter 4
- Planning, Pre-PD&E guidance from Part 1, Chapter 6 moved to Part 1, Chapter 4
 - Scoping process, Alternative corridor evaluation
- Engineering Considerations moved from Part 1, Chapter 4
- Concentration on engineering and design analysis
- Renamed **Engineering Analysis**

Now under Final Approval Process

Part 2, Chapter 6 Engineering Analysis

- Part 2, Chapter 14 Pedestrian and Bicycle Facilities will be deleted.
- Part 2, Chapter 30 Construction Impacts will be deleted.
- Pedestrian and Bike and Construction Impacts will be merged into Part 2, Chapter 6.
- Traffic analysis guidance will now be in the **NEW** Part 2, Chapter 5 Traffic Analysis.

Purpose of Part 2, Chapter 6

Guidance on engineering analysis and considerations

- Evaluation of existing conditions,
- Selection of design parameters
- Development of project alternatives
- Analysis of alternatives
- Selection of the recommended alternative
- Documentation of engineering analyses

Guide the Project Managers and their project teams

Part 2, Chapter 6 Engineering Analysis

- Engineering considerations in the Project Development Process.
- Engineering considerations include coordination with other functional areas within the Districts, Central Office and/or the Lead Federal Agency

Project Coordination

- Planning
 - Traffic Operations
 - Roadway Design
 - Structures
 - Drainage
 - Landscape
- Freight/Port/Aviation
 - Right of way
 - Survey
 - Permits
 - Local government

Engineering Analysis Tasks

The key elements in performing engineering and design evaluations during PD&E:

- Project needs
- Data collection
- Design controls and criteria
- Existing conditions analysis
- Alternatives analysis
- Documentation

Level of Detail of Analysis

Analysis is a function of:

- Project complexity and size, and
- The potential for environmental impact—Class of Action
 - Type 1 CEs and NMSAs (Lower Detail)
 - Type 2 CEs, EAs, EISs, SEIRs (High Detail)

Level of detail must be sufficient to fairly compare the effects of the alternatives on the social, economic, natural, cultural, and physical environment.

Engineering Documentation

Class of Action	Documentation
Type 1 CE	Design Documentation/ Report
NMSA	Design Documentation/Report
SEIR	Summarized in Section C of Project Evaluation Form, Detailed in Engineering Technical Memo
Type 2 CE	Summarized in Type 2 CE Form, Detailed in the Preliminary Engineering Report*
EA	Summarized in Alternatives Considered in EA, Detailed in the Preliminary Engineering Report*
EIS	Summarized in Alternatives Considered of DEIS/FEIS, Detailed in Preliminary Engineering Report*

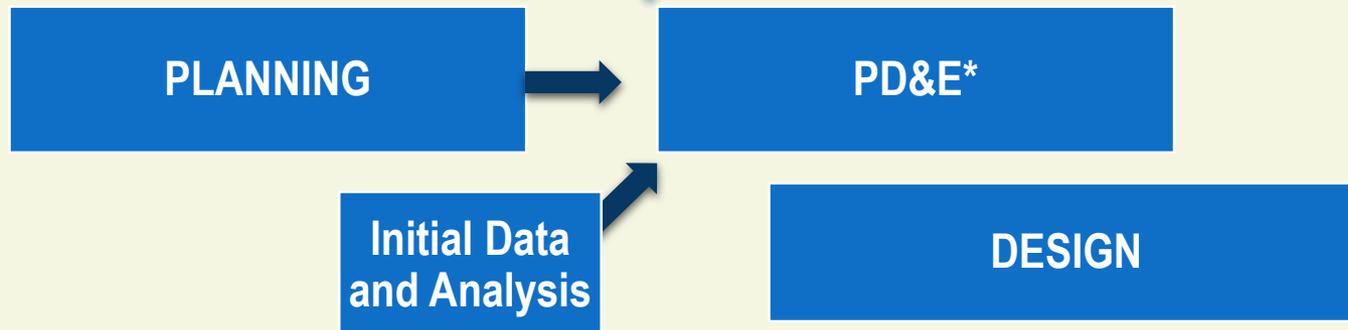
*Projects that have substantial Design Phase overlap will require preparation of **Alternatives Analysis Memo** to be stored with Design Documentation/ Report

Project Development Process

Conventional Process



Enhanced/Improved Process



*Projects that have substantial Design Phase overlap will require preparation of **Alternatives Analysis Memo** to be stored with Design Documentation/ Report

Alternatives Analysis

The alternatives analysis of a PD&E Study must consider the following alternatives:

- No-Action Alternative, or No-Build Alternative
- Transportation Systems Management and Operations (TSM&O) Alternative*
- Multimodal Alternative*
- Build Alternative(s)

Planning Process should have already decided on travel corridor or mode . 23 USC 168 provides conditions to adopt planning decisions (See **Part 1, Chapter 4)*

Number of Build Alternatives

- Consider any alternatives but analyze in detail only ones which meet the purpose of need and are feasible
- What alternatives were considered and eliminated through Planning Process?
 - Can you adopt Planning Decision thru **23 CFR Part 450**? Lead Agency would need to concur per **23 USC 168**
- Use Alternative Corridor Evaluation (ACE) to screen out alternatives before PD&E (**Part 1, Chapter 4**).
- Document in the Environmental Document and Engineering Report any alternative considered but eliminated.

Number of Build Alternatives

- Number of Build Alternatives to be analyzed in detail affects the project schedule and budget
- Only viable or reasonable build alternatives should be evaluated in detail.
 - A Type 2 CE or SEIR must evaluate at least one Build Alternative and a No-Action Alternative
 - An EA must evaluate at least one Build Alternative and a No-Action Alternative.
 - An EIS must evaluate reasonable alternatives or a “reasonable range” of alternatives in addition to a No-Action Alternative

Engineering Considerations

- Context Sensitive Solutions/Complete Streets
- Bike and Pedestrians
- Traffic Operations and Safety
- Express Lanes
- Access Management
- Interchanges on Interstate System
- Roundabouts and Intersection Concepts

- Intelligent Transportation System
- Stormwater Management
- Landscape
- Utilities and Railroad
- Survey and Mapping
- Geotechnical Investigation
- Structures and Bridges
- Transportation Management Plan
- Construction Impacts

Environmental Considerations

- Alternatives should avoid, minimize impacts to environmental resources.
- If resources are impacted, mitigation measures are required.
- Strict regulations if an alternative would impact:
 - Designated **Section 4(f)** resources (Part 2, Chapter 13)
 - Historic resources, Section 106 resource (Part 2, Chapter 12)
 - Floodplains and wetlands , Section 404 permit (Part 2, Chapter 18 & Chapter 24)

Comparative Alternatives Analysis

- Compare and contrast alternatives wrt the purpose and need, and quantify their impacts to the environment.
- Help the general public and Lead Agency understand the decision reached
- Comparison objectives
 - Costs
 - Environment Impacts
 - Operational performance
 - Safety performance
 - Public input

Value Engineering

Best to occur during PD&E after comparative alternatives evaluation and before Public Hearing

Include VE team recommendation in the alternatives analysis

Engineering Analysis in PD&E

Engineering Analysis Procedure

Traffic Analysis Procedure (NEW)

Changes in Transit Procedure

Overview of PD&E Manual Revisions

Traffic Analysis Chapter , Part 2

Chapter 5

A new chapter to document guidance for preparing the traffic forecast and analysis for PD&E Studies.

Guidance for scoping traffic analysis effort, traffic data requirements, analysis methodology and documentation.

Emphasis on developing an agreed upon methodology.

PART 2, CHAPTER 5

TRAFFIC ANALYSIS

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Part 2, Chapter 5 Traffic Analysis

- Will Require preparation of a methodology
- Will replace DTTM with Project Traffic Analysis Report (PTAR)
- Will provide an outline for PTAR which may be customized by the scale/size of the analysis
- Will require disclosure of assumptions, method, analysis, and results in plain language
- Will require PTAR be reviewed and checked for quality and reasonableness of the results

Traffic forecast for the project were developed using:	
<input type="checkbox"/> Travel Demand Model	<input type="checkbox"/> Growth Rates
Type of Travel Demand Model Used: <input type="checkbox"/> Metropolitan Planning Model <input type="checkbox"/> Other Model _____	<i>Refer to appropriate section of Project Traffic Analysis Report that discusses growth rates</i>
Is the travel demand model based on the latest adopted Long Range Transportation Plan?	
<input type="checkbox"/> YES	<input type="checkbox"/> NO
_____ Date when MPO adopted the latest Long Range Transportation Plan	Explain why?
_____ Base Year of Travel Demand Model	
_____ Horizon Year of Travel Demand Model	
Long Range Transportation Plan documentation is available at (provide web address): _____	
Traffic Data and Factors	
Standard K = _____ D Factor = _____ T_{Daily} = _____	Traffic Counts Collection Year = _____ Opening Year = _____ Interim Year = _____ Design Year = _____
Discuss any changes in land use, economics, population and employment data since the model was built	

This form to be submitted with the Traffic Analysis Assumptions Summary

Engineering Analysis in PD&E

Engineering Analysis Procedure

Traffic Analysis Procedure

Changes in Transit Procedure

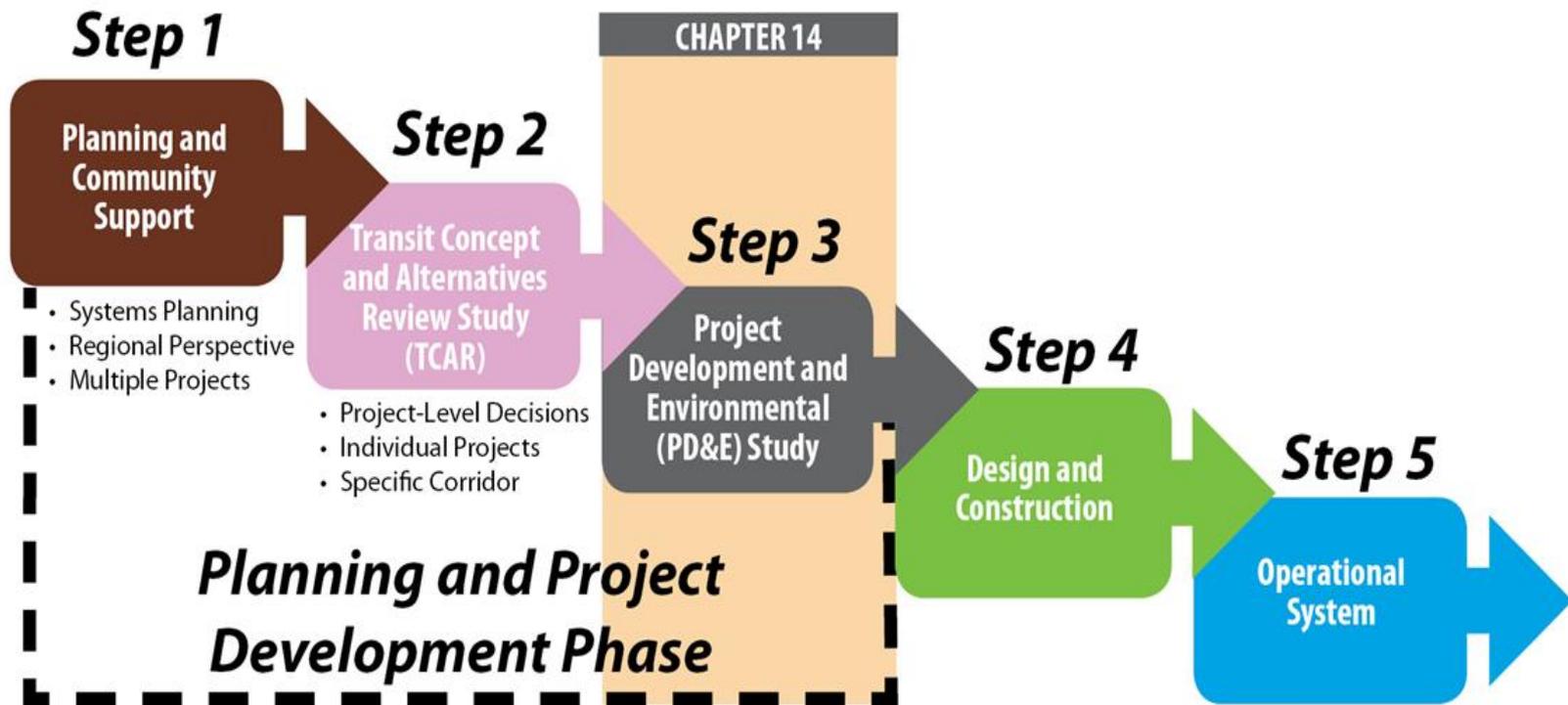
Overview of PD&E Manual Revisions

Part 1, Chapter 14

- Undergone major revisions/rewrite
- Concentration on Project Development (PD&E) phase
- Separated planning process from project development
 - Transit Planning Process will be in a Transit Concept Alternatives Review (TCAR)
 - CO-Transit Office is finalizing TCAR guidebook
- Renamed **Transit Project Delivery Process**
 - Will cover both FTA process and FHWA
 - State and Other Agencies funded projects will use Part 1, Chapter 10 process

Now under Final Approval Process

Part 1, Chapter 14 Transit Project Delivery



Part 1, Chapter 14 Transit Project Delivery

Guidance will be provided for transit projects funded thru

- Capital Investment Grant Programs
- New Starts
- Core Capacity
- Small Starts
- Programs of Interrelated Projects
- Formula Programs
- Discretionary Programs

CO- Transit will offer TCAR training (F2F) in Fall 16

Engineering Analysis in PD&E

Engineering Analysis Procedure

Traffic Analysis Procedure

Changes in Transit Procedure

Overview of PD&E Manual Revisions

PD&E Manual Revisions

- All chapters have been revised, reformatted, and/or rewritten.
- Two will be deleted (Part 2 Chapter 14 and Chapter 30)
- New Chapter—Traffic Analysis
- They will be published with a date in red font as they are approved.
- There will be Chapter specific training/webinar/CBTs
- Second round of revision will be after FDOT assume FHWA NEPA responsibilities
- Third round of revisions will be when Complete Streets is implemented within Roadway Design Procedures

Thank You

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