

# Cost Estimate Review

SH 183

Dallas County, TX

April 25 – April 27, 2011



U.S. Department of Transportation  
**Federal Highway Administration**



# Cost Estimate Review Objectives

- Conduct an unbiased risk-based review to verify the accuracy and reasonableness of the current total cost estimate.
- Develop a probability range for the cost estimate that represents the project's current stage of design.

# Cost Estimate Review Financial Plans (SAFETEA-LU)

- Threshold (All costs, PE, CN, R/W, UT, CE, etc.)
  - \$500 Million – Major Project – Required concurrence from HQ
  - \$100 to \$500 Million – Required, however review is at each Division's discretion
- "Cost to complete estimates based on reasonable assumptions as determined by the Secretary."
- Secretary = FHWA
- Reasonable assumptions = Risk based analysis

# Basis of Review

- Review based on estimates provided by TxDOT in advance with revisions made during the review
- Review to determine the reasonableness of assumptions used in the estimate
  - Not an independent FHWA estimate
  - Did not verify quantities and unit prices
  - Estimate remains the TxDOT estimate

# Review Participants

- Participants
  - FHWA
  - TxDOT
  - Halff
  - Civil Associates
  - Bridgefarmer

# Documentation Provided

- TxDOT's Cost Estimate with supporting background information
- Project Schedule

# Review Methodology

- **Review Team input**
  - FHWA
  - TxDOT
  - Project Consultants
- **Estimate Review**
  - Understanding of estimate development process
  - Threats and Opportunities for various items
  - Contingencies and Projected Escalation Rates

# Review Methodology (continued)

- Threats and Opportunities Analysis
  - Reviewed all Major cost elements.
  - Developed impacts and probabilities for significant project threats and opportunities
  - Developed probability assumption curves
- Performed Monte Carlo simulation to generate a project estimate forecast as a range



# Review Findings

## Good estimating practices

- Estimates are updated based on bid histories and inflation from District and Statewide projects
- Estimates are supported by extensive background information
- Major items were based on calculated quantities
- All costs are included in the total program estimate

# Estimate Adjustments

- Added Expended ROW costs - \$120.5 m
- Added Expended PE costs - \$15.0 m
- Added Noise Wall and Frontage Road Project - \$7.2 m
- Added Landscaping and Aesthetics – ½% of construction \$3.4 m
- Added a cost for project design details not included in the estimate of 3% - \$20.6 m
- Added ITS costs at 1% - \$6.9 m

# Estimate Adjustments

## Continued

- Added the cost of PPP procurement - \$4,000,000
- Traffic Signal Unit Cost was reduced to \$85,000
- Signing Unit Cost was reduced to \$6000
- Contingency was reduced from 20% to 15% to account for separating out the above noted costs which were originally in the 20% rate - \$34.4 m reduction

# Estimate Adjustments

## Impacts

- Pre-review TxDOT estimate = \$1.096 B (FY 2011 dollars and excludes TxDOT's costs and previous expenses).
- Post review TxDOT estimate = \$1.228 B (FY 2011 dollars, Includes all costs and updates but without inclusion of project risks).
- Post review TxDOT estimate = \$1.391 B (YOE dollars, includes inflation)

# Threats

- PPP Authority may not be granted – no funding indentified otherwise
- Time consuming/data intensive Corps 408 permitting process
- ROW concerns – outstanding parcels, hospital heliport/FAA coordination, Exxon tank farm, higher condemnation awards
- Outdoor advertising in City of Dallas

# Threats

## Continued

- Oil price increases
- Several major projects in the area
- Availability of DBE subcontractors
- High PI soils impacting pavement section
- Bike and pedestrian accommodation
- Utility relocations
- Environmental review delays

# Opportunities

- PPP Authority speeds project delivery
- PPP Authority takes advantage of lower interest rates
- PPP Authority allows for shift of risks related to utility relocations to the Developer
- Ongoing ROW acquisition (60% complete)

# Incorporation of Threats and Opportunities into the estimate

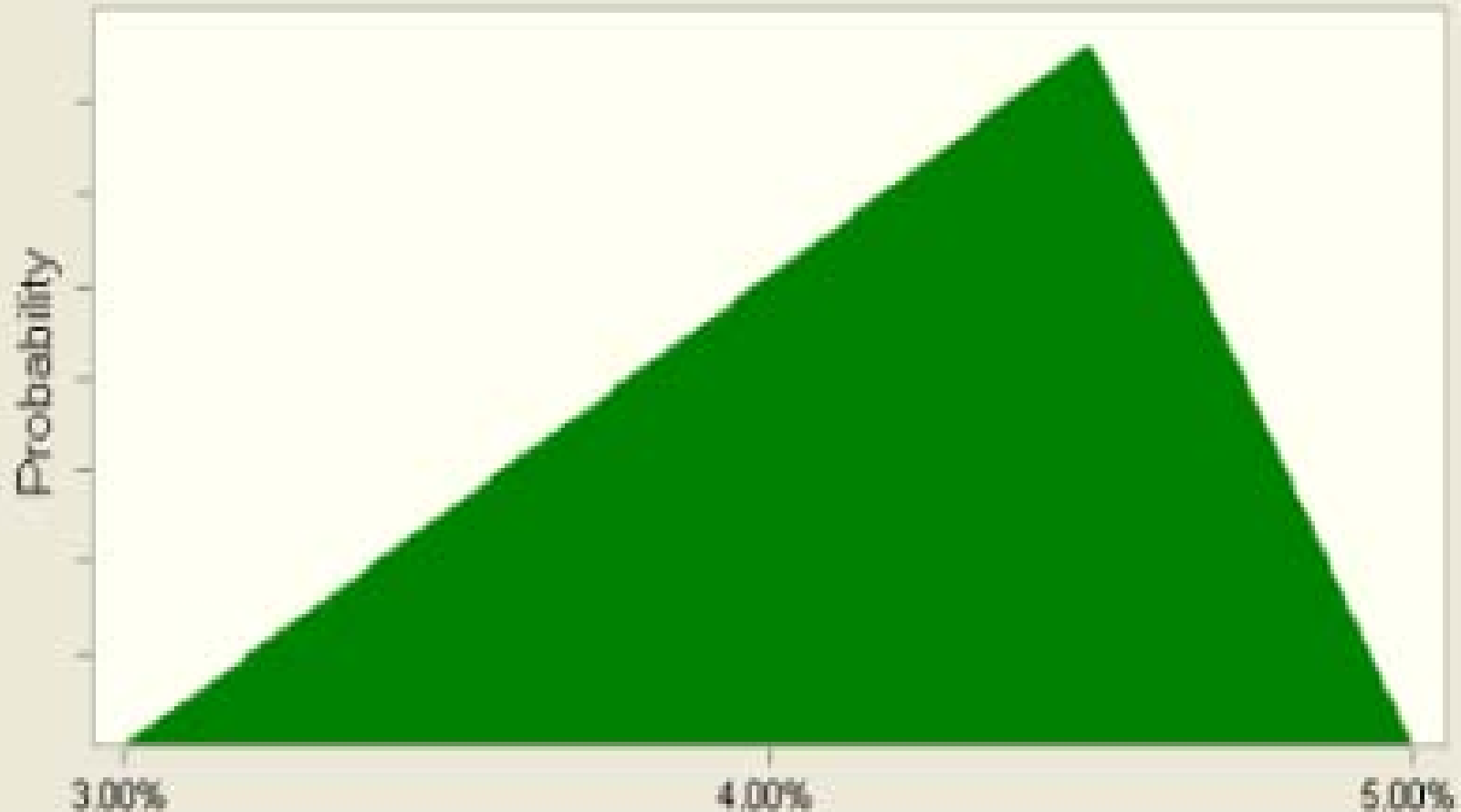
- Developed assumption curves for quantities and unit prices that model the cost and probability impact of the threat/opportunity
- Developed assumption curves for ROW, Utility Relocation, Engineering, and Escalation
- Crystal Ball software
  - 10,000 Monte Carlo iterations



# Risk Analysis

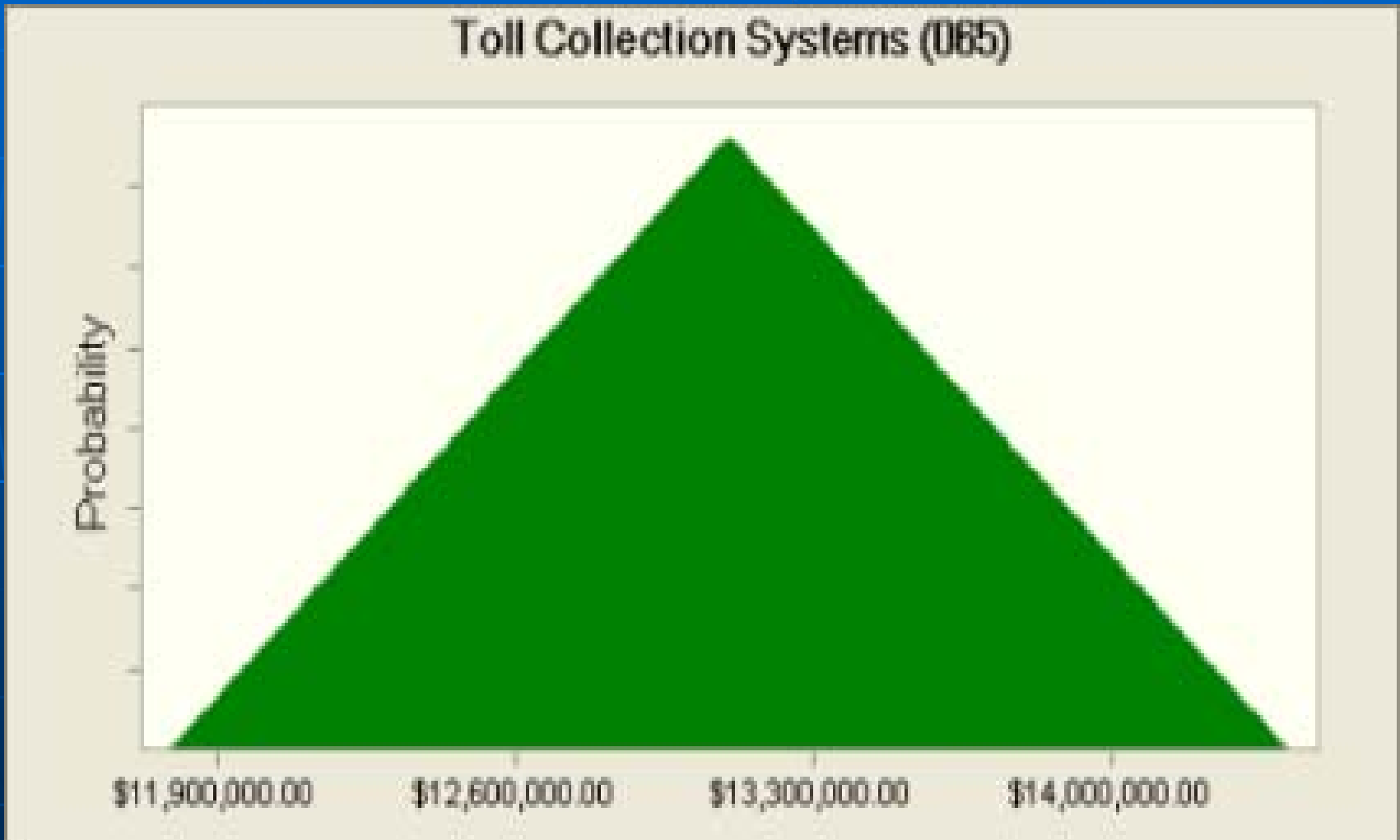
## Sample Assumption Curve

Escalation

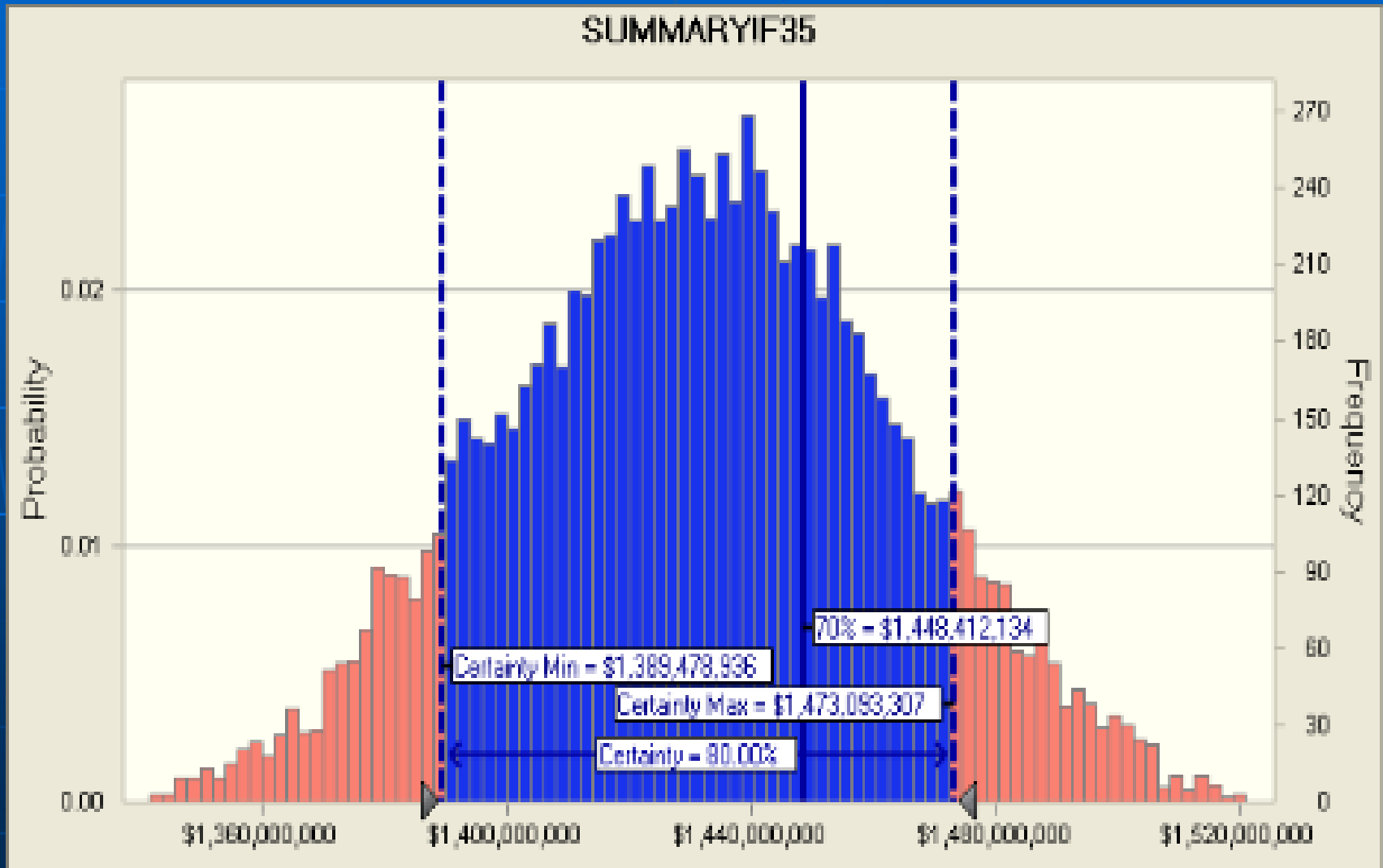


# Risk Analysis

## Sample Assumption Curve



# Total Projected Escalated



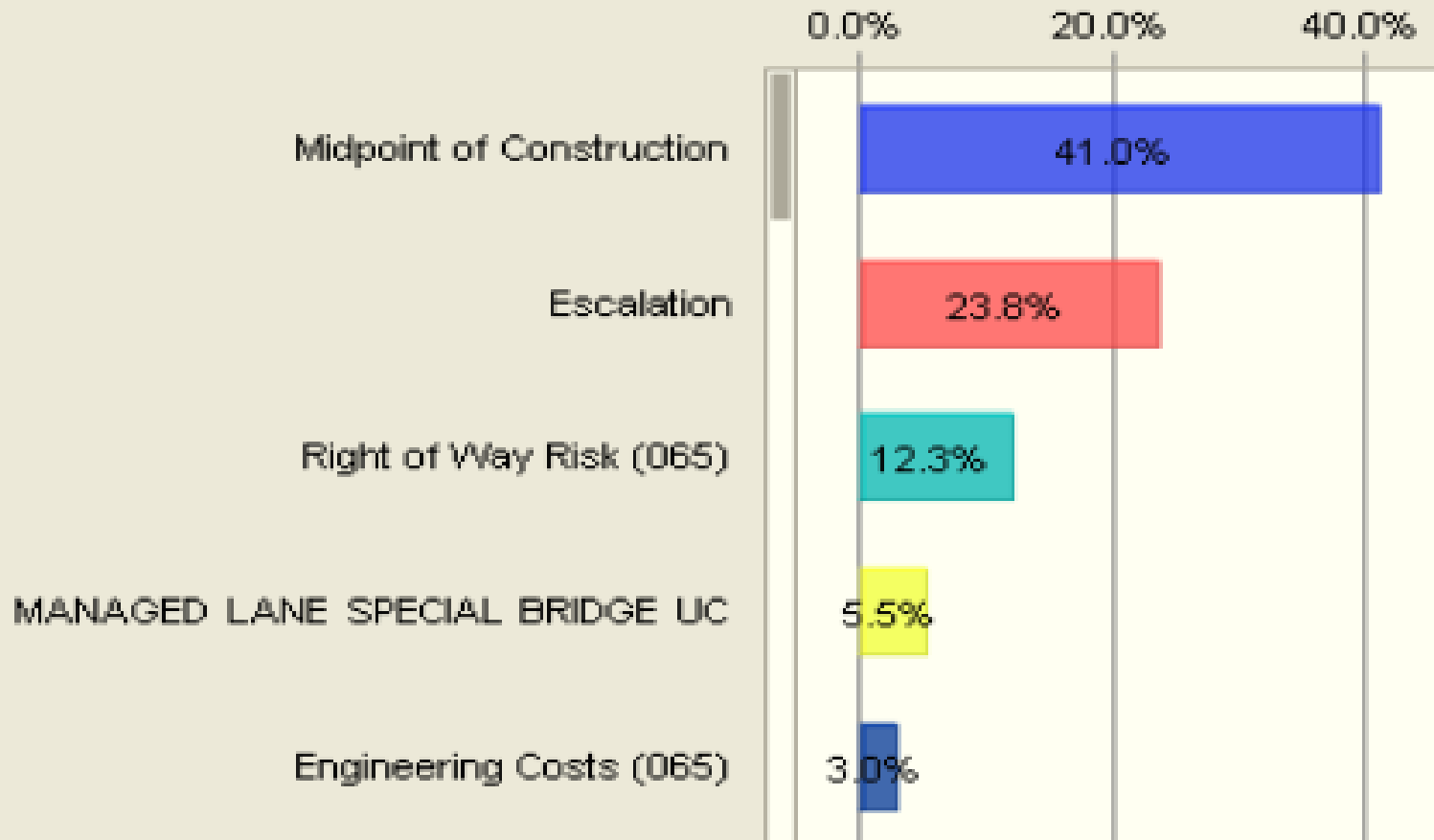
# Review Findings Summary

## Forecast: Total Project Cost

Percentile	Forecast Values
0%	\$ 1,329,894,199
10%	\$ 1,389,478,936
20%	\$ 1,403,400,776
30%	\$ 1,414,291,830
40%	\$ 1,423,196,772
50%	\$ 1,431,511,669
60%	\$ 1,439,727,172
70%	\$ 1,448,412,134
80%	\$ 1,458,522,845
90%	\$ 1,473,093,307
100%	\$ 1,536,588,659

# Sensitivity Chart

Sensitivity: F35



# Cost Estimate Review Recommendations

- Communicate in terms of Total Project Costs
- Develop a plan to manage threats and opportunities
- Incorporate results into the PMP and FP

# Cost Estimate Review

## Next steps:

- FHWA will prepare a final report documenting review findings.
  - Draft report for review within 30 days.
  - FHWA will review the draft and will forward it to workshop participants for review and comment
  - Final report within 30 days after receipt of comments will be forwarded to TxDOT.
- FHWA uses the report for the review of the Initial Financial Plan.

# Cost Estimate Review

Questions?