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# *TRACER* Overview



- Improving conceptual estimating.
- What is “Parametric Cost Estimating” & How Can it Help?
- TRACER Prototype.
- Benefits of *TRACER*.
- Overview of AASHTO Solicitation.

# Conceptual Estimating Techniques



1. Historical/Bid Based
2. Detailed Material Take-Off (MTO)
3. Parametric Cost-Based

# Historical / Bid Based



## The Pro's:

- Typically the most utilized approach.
- Easy to do (\$/SF of another project type).

## The Con's:

- Historical projects may not fit future project “exactly”.
- New design/construction technologies overlooked.
- Historical \$'s can't accurately predict future \$'s.
- Doesn't allow for easy “Alternative Analysis”.

# Detailed Material Take-Off (MTO)



## The Pro's

- Makes the most sense to an estimator.
- Would be the most accurate (if feasible).

## The Con's:

- Insufficient design available for a MTO estimate.
- Time & Labor intensive.
- Doesn't allow for easy "Alternative Analysis".

# What Other Options Are There?



Parametric Cost-Based Estimating is a **proven** estimating approach for generating highly **detailed** conceptual estimates **quickly and easily**.

# Parametric Cost-Based



## What is “Parametric Cost Estimating”?

- Parametric Model – “Conceptually, a bridge is always a bridge...”
- Can scale the Model “UP” or “DOWN”
- Can “BUILD” the bridge anywhere
- Utilizes trusted Cost Data

# How Does It Work?

**Inputs / Parameters** — Ensure the estimate reflects the exact scope of the project being estimated.



**Parametric Model**



**Generate Estimate**

Detailed estimate calculated automatically.



# *TRACER* Prototype

## Overview



- *TRACER*<sup>TM</sup> = “TRAnspOrtation Cost EstimatorR”
- *TRACER* is a parametric cost estimating system based on a patented estimating methodology.
- The Parametric Cost-Based Models need to be fully developed for the transportation industry.
- The Prototype allows estimators to evaluate the parametric approach.

# TRACER Prototype

## Project Setup Screen

- Location Cost Modifiers
- Setting Program Year (to escalate \$'s)

Modify Project

Project Name:

Description:

State:

Location:

Units Option:  English  Metric

Project Number:

Prepared By:

Date Prepared:

Program Year:

Comments:

Location Cost Factors | Location Modifiers

Description	Material	Labor	Equipment
General	0.956	0.735	0.943
Site Work	0.954	0.907	0.943
Concrete	0.793	0.688	0.943
Masonry	0.953	0.648	0.943
Metals	1.009	0.782	0.943
Wood/Plastic	0.835	0.678	0.943
Thermal/Moistu	0.871	0.699	0.943
Doors/Window:	0.968	0.666	0.943
Finishes	0.950	0.654	0.943
Specialties	1.005	0.746	0.943
Equipment	1.005	0.746	0.943
Furnishings	1.005	0.746	0.943

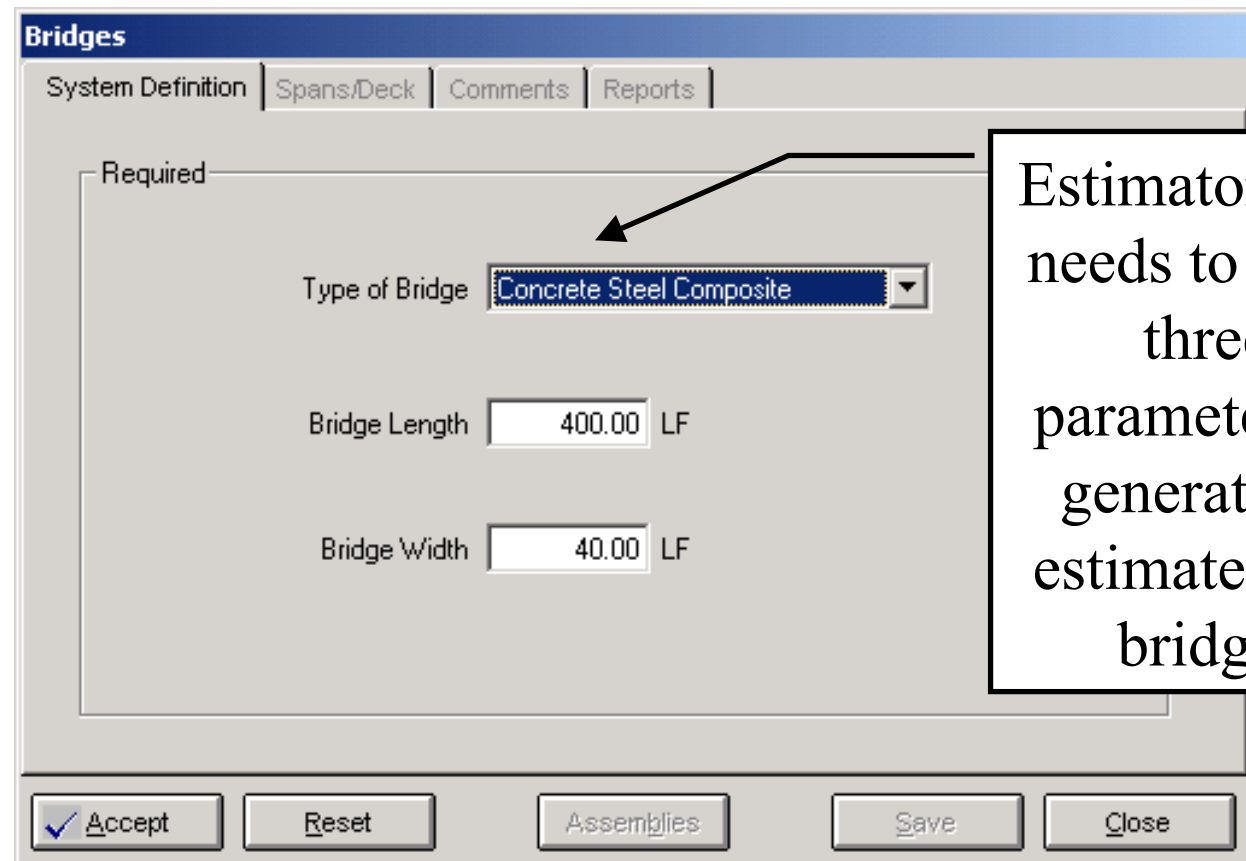
\* Required Field

Update Cell  
Column Global  
Defaults  
OK Cancel

# TRACER Prototype

## Bridge Model

- Required Parameters



The screenshot shows a software window titled "Bridges" with four tabs: "System Definition", "Spans/Deck", "Comments", and "Reports". The "System Definition" tab is active. Inside the window, there is a section labeled "Required" containing three input fields:

- "Type of Bridge" is a dropdown menu with "Concrete Steel Composite" selected.
- "Bridge Length" is a text box containing "400.00" followed by "LF".
- "Bridge Width" is a text box containing "40.00" followed by "LF".

At the bottom of the window, there are five buttons: "Accept" (with a checkmark), "Reset", "Assemblies", "Save", and "Close".

Estimator only needs to input three parameters to generate an estimate for a bridge.

# TRACER Prototype

## Bridge Model (cont'd)

- Secondary Parameters

	Default	User	
Number of Spans	10	10	EA
Length per Span	40.00	40.00	FT
Number of Bents	10		EA
Number of Columns	50	65	EA
Height of Bridge Deck	35.00	35.00	FT

Buttons:  Accept, Reset, Assemblies, Save, Close

Secondary Parameters allow for additional tailoring of the estimate to future project scope.

# TRACER Prototype

## Bridge Model (cont'd)

- Items included in Estimate automatically.
- M/L/E \$'s (Un-Marked Up) localized to project location.
- Qty's calculated for Estimator based on Parameter Inputs.

Assembly Qty / \$

Sort Assemblies By:  
 Assembly  Description

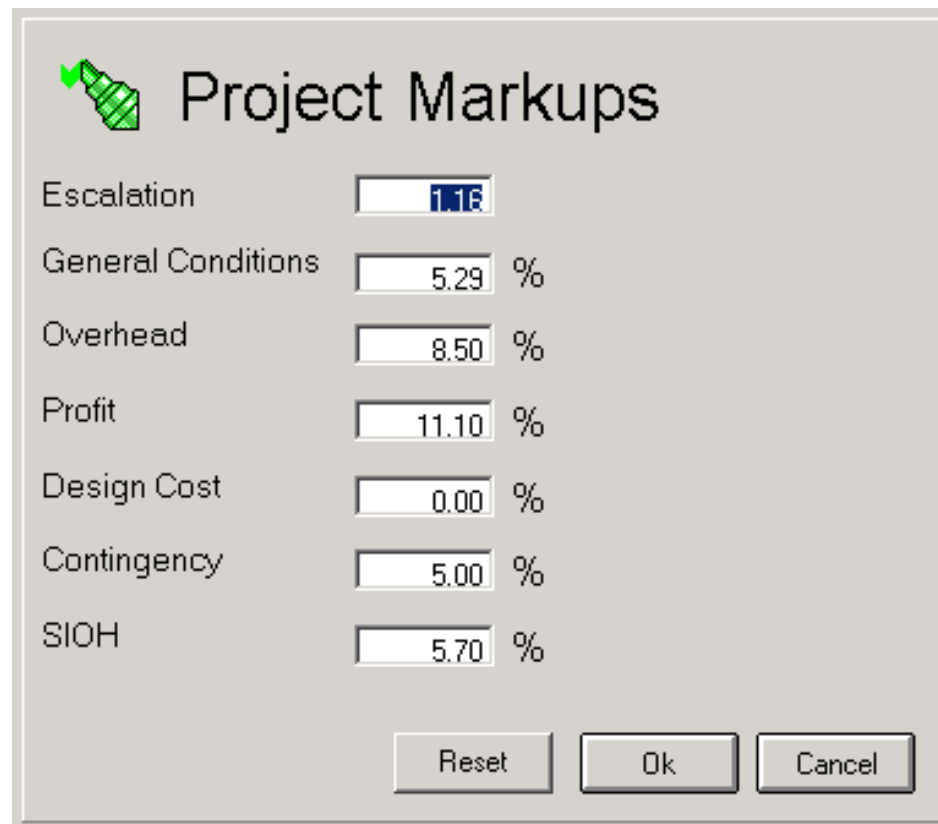
Assem	Description	Qty	UM	Material	Labor	Equipment	Extended
▶ 170301	Rough Grading, 0.0012 T (12G), 1 Pass	128,407.00	SY	0.00	0.20	0.18	\$48,152.63
170301	Fine Grading, 0.012 T (120G), 2 Passes	11,162.00	SY	0.00	0.09	0.07	\$1,751.32
170302	Excavation, Spoil To Side	1,057.00	CY	0.00	0.36	0.22	\$612.95
170302	Soil, 8.05km (5 Mi), Dump Truck, Load/Hauloff	271.00	CY	0.00	1.16	1.45	\$706.66
170304	950, 2.29m3 (3 CY), Delivered & Dumped, Bac	51.00	CY	22.59	2.15	2.15	\$1,371.07
170304	Backfill, Lrg Spot Footing Excav Material, 950,	840.00	CY	0.00	1.13	1.36	\$2,088.58
170305	Compact, Ftg Excav, Excav Material Backfill	1,910.00	CY	0.00	3.16	0.08	\$6,190.50
170305	Compact Soil W/Vibrating Plate	260.00	CY	0.00	1.19	0.09	\$333.42
170305	Spread Dumped Borrow & Compact W/Roller	36,660.00	CY	0.00	1.52	0.04	\$56,976.97
170401	General Area Cleanup	3.03	ACRE	0.00	274.75	17.51	\$884.30
180101	Cement Stabilized Base	790.00	CY	24.55	5.99	2.51	\$26,105.23
180105	Guardrail, Single Rail, Wood Posts	700.00	LF	12.22	1.59	0.21	\$9,812.46
180105	Guardrail, Single Rail, Wood Posts, Ends	4.00	EA	8.93	1.65	0.27	\$43.39
180502	Sediment Fence, Temporary	1,456.00	LF	1.10	3.02	1.04	\$7,502.62
180504	Seeding, Vegetative Cover	0.67	ACRE	20,534.99	233.67	127.74	\$14,002.89
180504	Fertilizer, Hydr Spread	0.67	ACRE	96.61	43.36	17.88	\$105.77
180601	Form Deck, 3 Uses	22,193.00	SF	0.41	3.41	0.00	\$84,699.58
180601	Rebar, Bridge Deck	61,100.00	Lb	0.28	0.22	0.00	\$30,097.86

**Total: \$2,694,240.75**

# TRACER Prototype

## Project Markups

- Costs Marked-Up using default markup %'s.
- Markup %'s are different for every individual project.
- Costs Escalated to Program Year for the Estimator.



The image shows a software dialog box titled "Project Markups". It features a green checkmark icon in the top left corner. The dialog contains seven input fields, each with a numerical value and a percentage sign. At the bottom, there are three buttons: "Reset", "Ok", and "Cancel".

Category	Value	Unit
Escalation	1.16	
General Conditions	5.29	%
Overhead	8.50	%
Profit	11.10	%
Design Cost	0.00	%
Contingency	5.00	%
SIOH	5.70	%

# *TRACER* Benefits



- Ensure consistent estimates (eliminates errors/omissions)...
  - No matter who makes estimate...
  - No matter where estimate is made.
- Align scope, expectations, and budget across all departments/divisions that come into contact with a project.
- Generate accurate, quantified, and sufficiently detailed estimates during early planning & programming phases.
- Allow easy alternative analysis (VE).

# *TRACER* Benefits (Cont'd)



- Parametric models can be updated easily to reflect new design or material standards.
- Fast & Easy to Learn and Implement (ROI)
- Every estimate is project specific.
- Baseline estimate for use throughout project → The “AUDIT TRAIL”.

# *TRACER* Benefits (Cont'd)



- Proven Conceptual Estimating approach.
  - In use for approx. 20 years & validated against actual construction costs to be highly accurate.
- Utilizes TRUSTED sources of Cost Data.
  - National Unit Price Book (UPB)
  - State Bid-Item Lists
- Will enhance currently used estimating tools (e.g., CES and Estimator Modules)

# *TRACER* Solicitation Notes



- Develop cost-based parametric estimating models to extend the current capabilities of the **Trns•port CES & Estimator** products
  - Phase 1 – Initially develop as a **stand-alone**, fully functioning PC tool that can be utilized by one user or a network of users.
  - Phase 2 – **Full integration into Trns•port CES/Estimator & all supported client/server environments.**
- Project Length (Phase 1) – **8 to 10 Months**

# *TRACER* Solicitation Dates



- Solicitation for Phase 1 has been sent by AASHTO to DOT's (**August 2002**).
- States will have until **Nov 2002** to respond.
- Solicitation calls for approx. **10 States** to participate.
- Supporting States drive final software requirements through TRT & JAD committees.

# *TRACER* Wrap-up

## Questions / Comments?

For additional information or for a  
Prototype CD, contact:

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