2002 TEA
Austin, TX

Scotty Martin
Earth Tech

November 4, 2002

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 estimated calculated automatically.

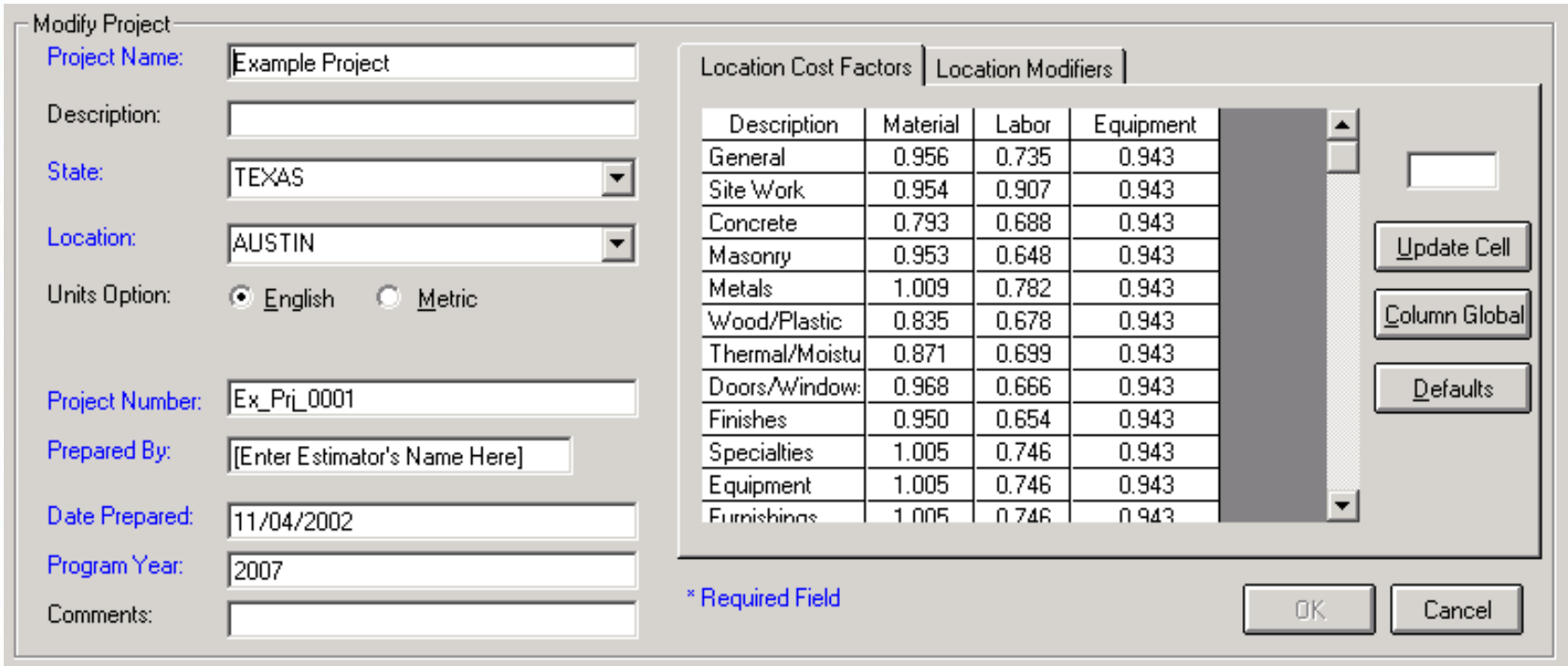
TRACER Prototype
Overview

- *TRACER*^{TM} = "TRAnsportation Cost EstimatoR"
- *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

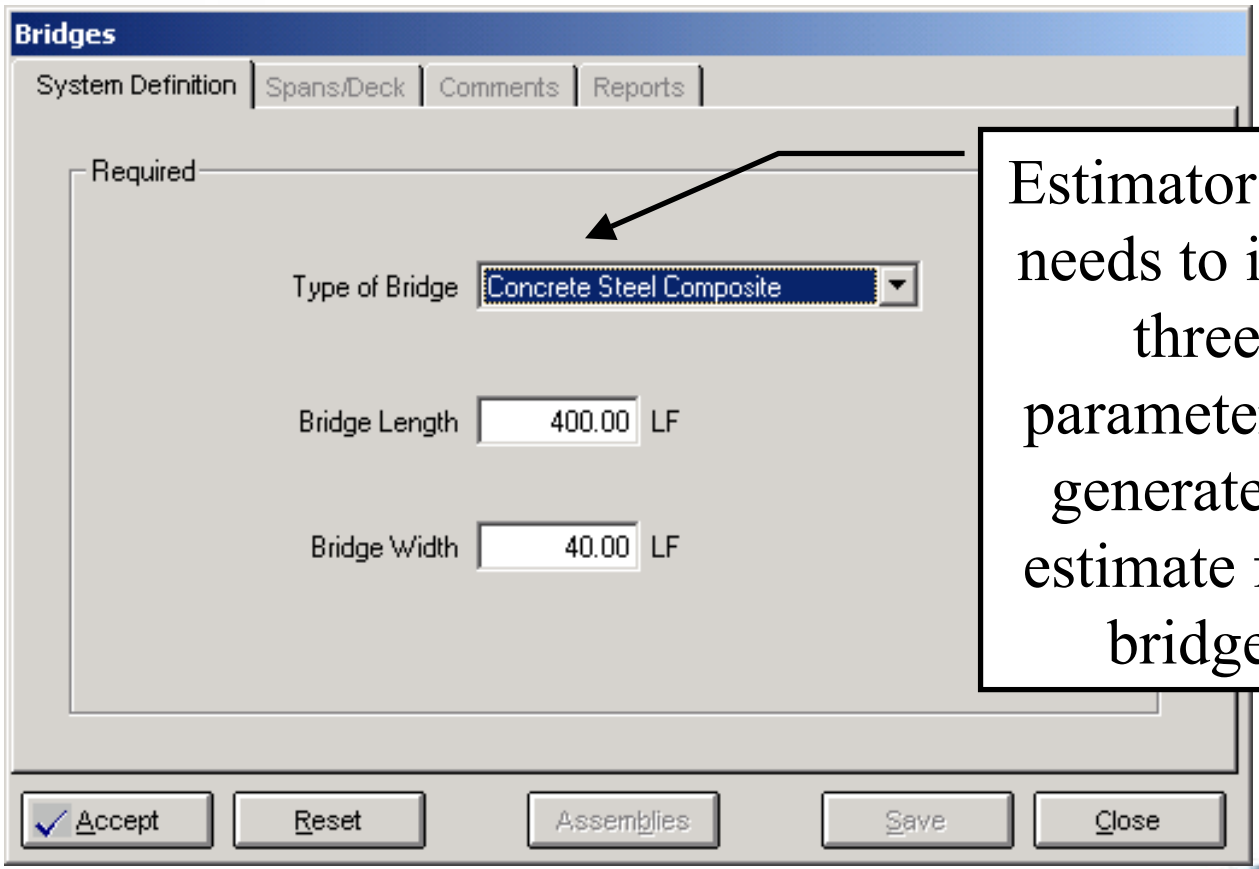
Project Setup Screen

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



TRACER Prototype
Bridge Model

- Required Parameters



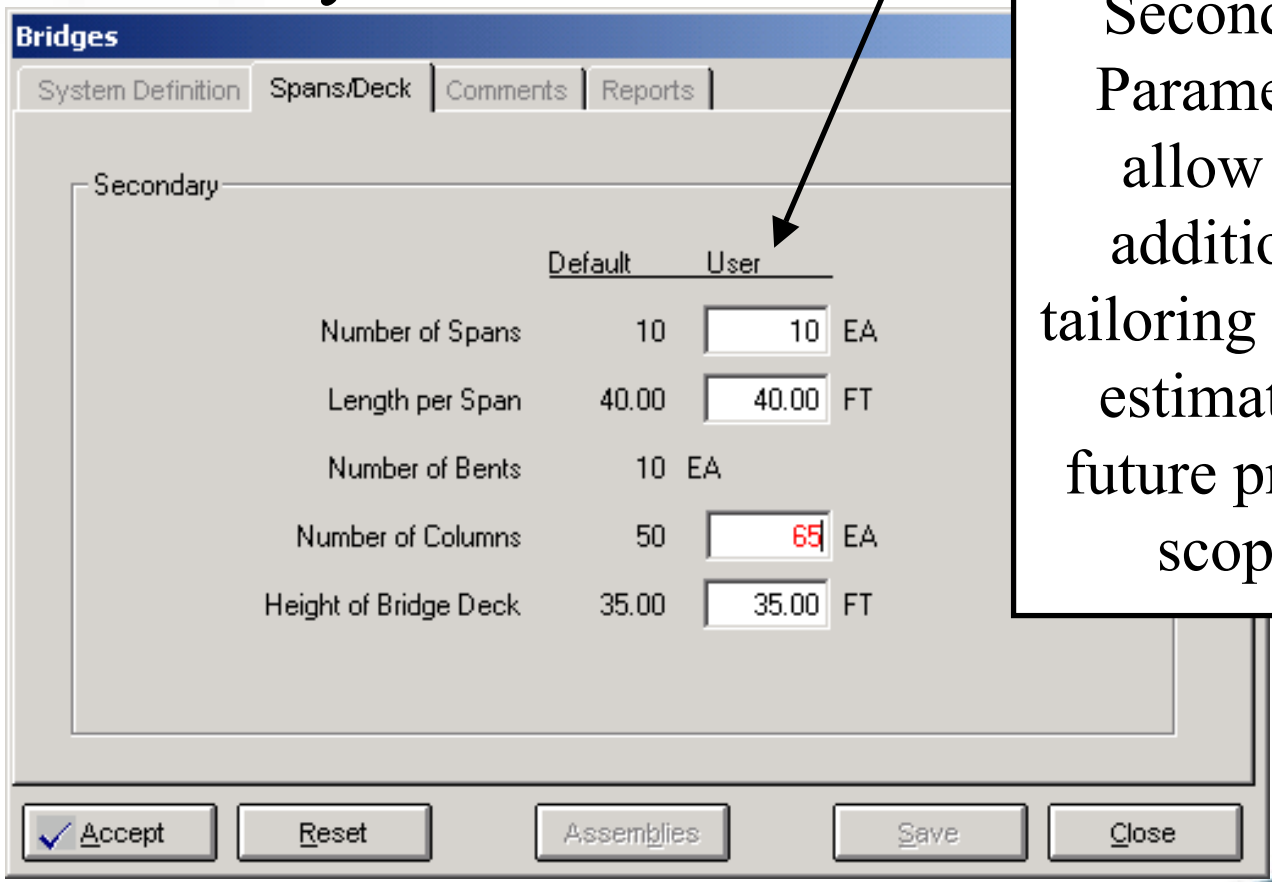
Estimator only needs to input three parameters to generate an estimate for a bridge.

Earth Tech

TRACER Prototype

Bridge Model (cont'd)

- Secondary Parameters



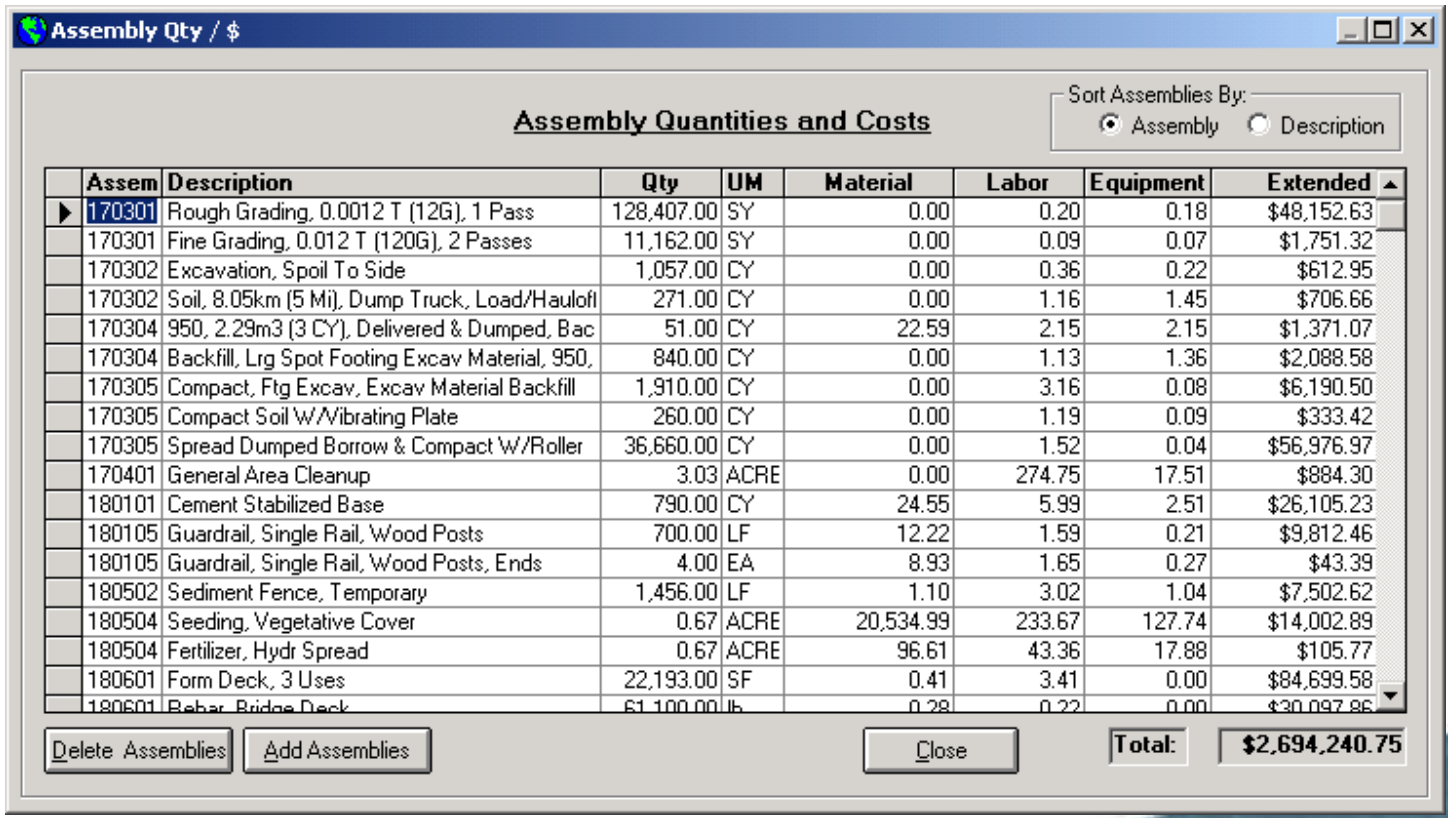
Secondary Parameters allow for additional tailoring of the estimate to future project scope.

Earth Tech

TRACER Prototype

Bridge Model (cont'd)

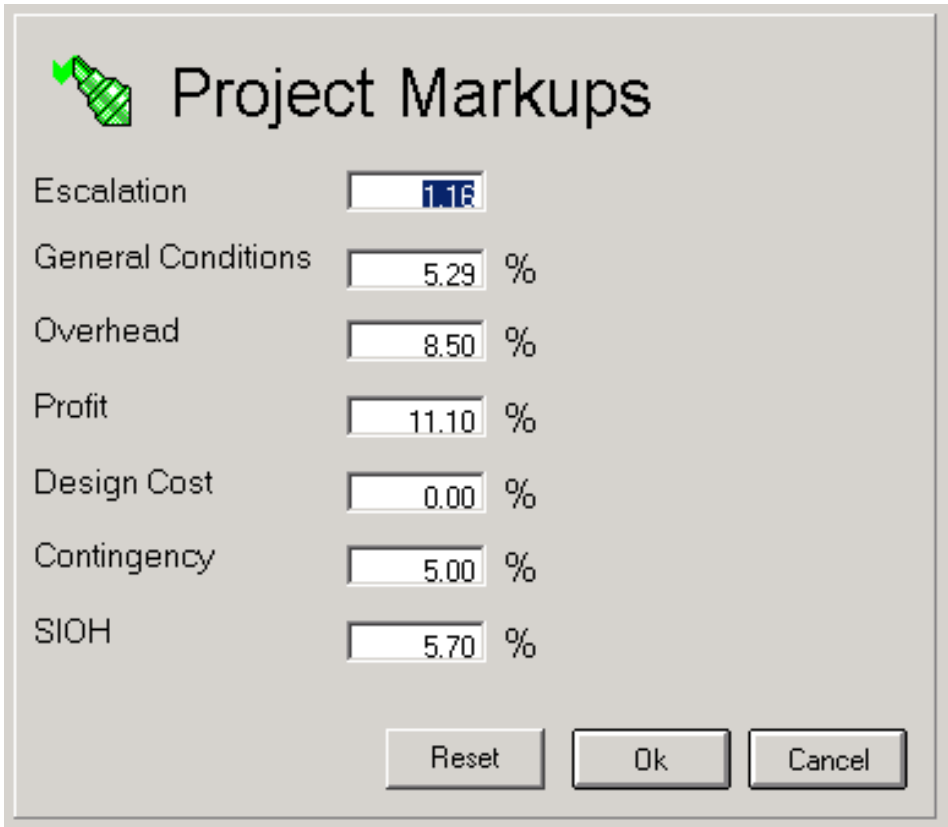
- Items included in Estimate automatically.
- M/L/E $'s (Un-Marked Up) localized to project location.
- Qty's calculated for Estimator based on Parameter Inputs.



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/Hauloft	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

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.



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:

Scotty Martin, Earth Tech

Phone – 303.771.3103

Email – scotty.martin@earthtech.com