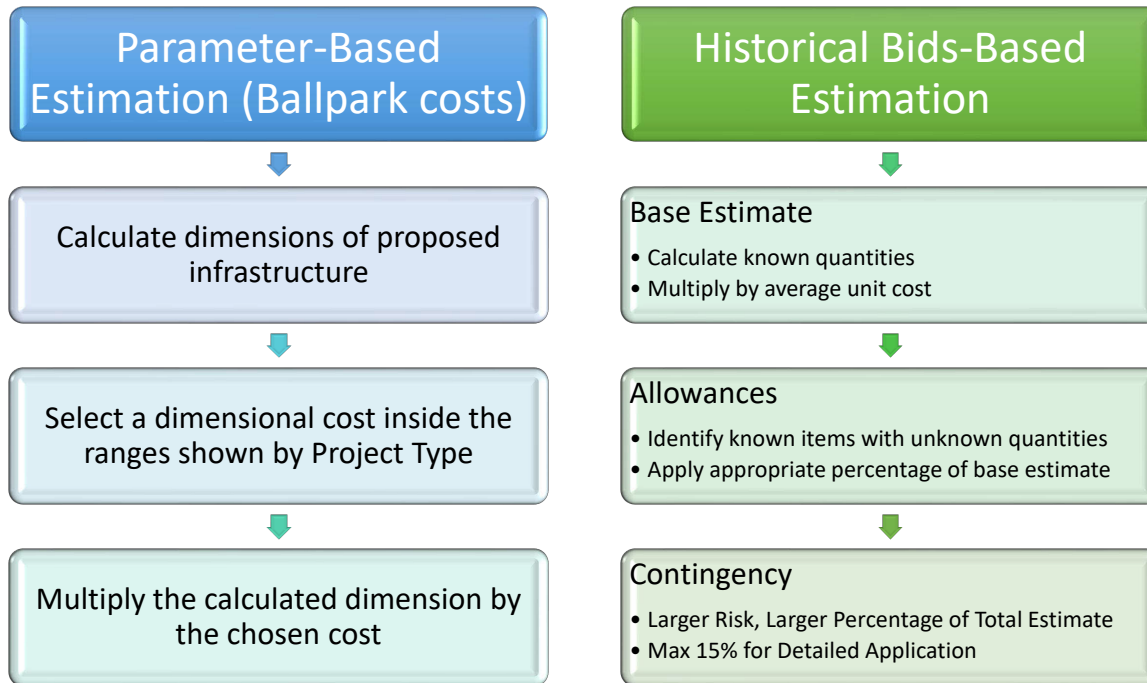


# Construction Cost Estimate Assistance Tool

The purpose of this document is to supplement TxDOT's Construction Cost Estimating Guide (CCEG) with recommended practices for the Preliminary Application (PA) and Detailed Application (DA) phases of TxDOT's 2023 Transportation Alternatives Program (TA) Call for Projects. The CCEG is published by TxDOT's Transportation Programs Division (TPD) Project and Portfolio Management Section and is available on [txdot.gov](http://txdot.gov) (Construction Cost Estimating Guide). The objective of this document in coordination with the CCEG is to enhance the accuracy of the preliminary construction cost estimates prepared for the 2023 TA Program Call.



## Preliminary Application (PA) Estimates

Both Estimation Methods (Parametric and Historic Bids-Based) are acceptable when preparing estimates for PAs. Contingency % is limited to 30% for PAs.

## Detailed Application (DA) Estimates

Parametric Estimation is not acceptable when preparing estimates for DAs. A ballpark estimate can be used as a starting point or a check on the reasonableness of a bids-based estimate. Allowances should be refined and reduced for DAs. Contingency % is limited to **15% Max for DAs**.

Recommended Estimate for Preliminary Engineering Costs (PS&E Development and Environmental) is **20%** of Total Construction Cost Estimate.

## Useful Links:

[Link to TxDOT TA Program website \(2023 TxDOT TA Program Guide, Applications, Application Instructions, Contact Information, Technical Assistance Tools, References\)](#)

[Link to TxDOT Construction Cost Estimating Guide](#)

[Link to TxDOT Bid Item Averages Dashboard](#)

[For projects with Railroad Crossing, See Railroad Guidance Document posted on TxDOT TA Program website](#)

This tool is not intended to provide a complete basis for Construction Cost Estimates. However, the information in this tool can be useful to Project Sponsors in the preparation of Preliminary or Detailed Application estimates for Transportation Alternative Program Calls.

*For technical assistance regarding this tool or construction cost estimating, please contact your TxDOT District TA Coordinator.*

## Parameter-Based Estimation (Ballpark costs)



Calculate dimensions of proposed infrastructure



Select a dimensional cost inside the ranges shown by Project Type



Multiply the calculated dimension by the chosen cost

## Construction Cost Estimating Guidance for Parameter-Based Estimation

Parametric construction costs estimates will only be accepted with Preliminary Applications for the 2023 TA Program Call.

1) Calculate the dimensions of the proposed bicycle or pedestrian facility and determine what level of complexity is expected for the project.

2) Based on the level of complexity expected and your chosen dimension (linear foot, square foot, linear mile), select a unit cost within the ranges shown in the Average Total Project Construction Costs table.

3) Multiply the calculated dimension by the chosen unit cost and you have a ballpark conceptual estimate to work with.

Average Total Project Construction Costs				
		Average	Low	High
Sidewalk	Linear Foot	\$ 163	\$ 74	\$ 448
Sidewalk	Square Foot	\$ 23	\$ 14	\$ 41
Sidewalk	Linear Mile	\$ 860,640	\$ 390,720	\$ 2,365,440
Shared Use Path	Linear Foot	\$ 260	\$ 198	\$ 303
Shared Use Path	Square Foot	\$ 24	\$ 17	\$ 30
Shared Use Path	Linear Mile	\$ 1,372,800	\$ 1,045,440	\$ 1,599,840
Based on Bike/Ped Facility Dimensions, not Project Limits.				
Last Updated: 12/22/2022				

### Notes:

Ballpark estimating can serve as a check for more detailed estimating procedures. The total estimated cost derived from another method should fall within the ballpark high and low values. If the total cost is not within that range, the estimate may be either incomplete or overly generous.

# Historical Bids-Based Estimation



## Base Estimate

- Calculate known quantities
- Multiply by average unit cost



## Allowances

- Identify known items with unknown quantities
- Apply appropriate percentage of base estimate



## Contingency

- Larger Risk, Larger Percentage
- Max 15% for Detailed Application

## Construction Cost Estimating Guidance for Historic Bid-Based Estimation

Historic Bid-Based Estimates are acceptable for either Preliminary or Detailed Applications. As the construction cost estimate is matured and refined, there should be a higher confidence in the base estimate with a corresponding reduction in allowances and contingency percentage.

The Base Estimate consists of calculated quantities for known items of work with estimated unit prices based on historical bids. For most TxDOT projects, historical bid information is available on TxDOT's Bid Item Averages Dashboard (See link below). The Commonly Used Items table in this document was produced from actual transportation alternative (TA) project lettings. The unit cost of many of these items vary significantly when compared to TxDOT's Bid Item Averages, largely due to the difference in scale and quantities between traditional TA projects and standard TxDOT Highway projects. Lower quantities typically result in higher unit costs, and higher quantities the opposite.

Allowances consist of items of work that are known to be required on a project, but are not yet quantifiable. The Commonly Used Items table in this document shows a typical range of allowances derived from TA program project bids from the 2019 TA Call for Projects. You can estimate an allowance as a percentage of the base estimate or by parametric estimation. The allowance percentage should be proportionate with the extent of work expected. For example, in an urban area with established storm drains and no planned changes to roadway pavement, the drainage allowance should be minimal. In a developing area with open ditches that will likely need to be enclosed or relocated to accommodate bicycle or pedestrian facilities, the drainage allowance should be much higher. For DAs with PS&E at or greater than 60% completion, allowances should be replaced with calculated quantities.

Contingency is assigned based on the level of risk associated with an estimate due to unknowns or uncertainties. The CCEG details a risk based contingency estimating process. Whatever process is used, the contingency component should reflect the level of confidence the estimator has in the estimate. For PAs, the contingency may be as high as 30%. For a DA, contingency is recommended at 10% or less, and is restricted to a maximum of 15%, of the total estimate (base estimate + allowances). For DAs with PS&E at or greater than 60% completion, contingency will not be allowed.

### Notes:

[Click here for link to TxDOT Bid Item Averages Dashboard.](#)

The Total Construction Cost Estimate is the sum of the Base Estimate + Allowances + Risk Based Contingency.

Based on 2023 TA Program eligibility criteria, TA funding for incidental construction items will be limited to 30% of the Total Cost Estimate, and TA funding for amenities will be limited to 10% of the Total Cost Estimate. Any incidental construction or amenities exceeding these limits will not be eligible for federal reimbursement and will require a local funding source.

If Project Sponsor is seeking reimbursement for Preliminary Engineering Costs (PS&E, Environmental), these costs should generally be estimated at 20% of the Total Construction Cost Estimate.

An escalation factor for inflation of 4% per year from Project Award to Estimated Year of Letting will be added to all construction cost estimates in the Detailed Application.

***Project Sponsors are encouraged to engage with experienced engineering staff to assist in the development of construction cost estimates***

These bid items are commonly found within TxDOT Transportation Alternative projects. These cost ranges are based on actual bid items for TA projects.

Bid Item group	Commonly Used Items	Recommended Unit Cost	Historical Unit Cost Range	Unit	Notes
Most frequently used	Curb Ramps	\$2,000 - \$2,500	\$1,400 - \$3500	Each	Highly dependent on quantity.
	Curb Ramps		\$70 - \$335	Square Yard	
	Concrete Sidewalk/SUP (4"-6")	\$80 - \$100	\$54 - \$260	Square Yard	Varies with quantity.
	Concrete Curb or Curb & Gutter	\$30 - \$45	\$18 - \$190	Linear Foot	Varies with quantity and type.
Site prep	Preparing ROW		\$300 - \$1,500	Station	Highly dependent on quantity.
	Preparing ROW		\$3,300 - \$25,000	Acre	Highly dependent on quantity.
	Tree Removal		\$454 - \$2,540	Each	Varies based on tree size and quantity.
	Embankment	\$20 - \$30	\$10 - \$140	Cubic Yard	
	Excavation	\$15 - \$35	\$15 - \$62	Cubic Yard	
Pavement Items	Removing Concrete	\$15 - \$25	\$8.75 - \$120	Square Yard	
	Removing Asphalt or Base	\$10 - \$30	\$5 - \$68	Square Yard	
	Removing Concrete Curb or Curb & Gutter	\$10 - \$15	\$5 - \$30	Linear Foot	
	Asphalt Pavement		\$188 - \$300	Ton	For projects with more than 1000 tons, see Statewide Average Bid Prices.
	Concrete Pavement		\$105	Square Yard	See Statewide Average Bid Prices.
	Constructing Detours		\$40	Square Yard	See Statewide Average Bid Prices.
	Cut and Restore Asphalt Pavement	\$60 - \$80	\$20 - \$95	Square Yard	
	Driveways and Intersections	\$75 - \$110	\$30 - \$140	Square Yard	
	Flexible Base		\$20 - \$160	Square Yard	Varies with type, quantity, and depth. See Statewide Average Bid Prices.
Adjacent/Parallel infrastructure adjustments	Adjusting Manholes/Ground Boxes	\$500 - \$1,000	\$250 - \$4,500	Each	
	Armored Curb		\$600	Linear Foot	See Statewide Average Bid Prices.
	Fencing		\$8 - \$95	Linear Foot	Varies with type and quantity.
	Miscellaneous Concrete		\$500 - \$2,100	Cubic Yard	Varies with type and quantity.
	Mailbox (Install, Relocate)	\$145 - \$300	\$145 - \$2,800	Each	
	Pedestrian Push Buttons		\$1,425	Each	See Statewide Average Bid Prices.
	Pedestrian Bollards		\$625 - \$2,558	Each	
	Landscape Amenities		\$500 - \$11,000	Each	Varies with type and quantity.
	Railing (MBGF, Concrete)		\$95 - \$319	Linear Foot	Varies by type.
	Railing End Treatment		\$3,950.47	Each	See Statewide Average Bid Prices.
	Riprap		\$60 - \$820	Cubic Yard	Varies with type and quantity.
Pavement Marking & Signs	Bicycle Symbols		\$446.25 - \$600	Each	See Statewide Average Bid Prices.
	Eliminating Linear Striping		\$1 - \$10.50	Linear Foot	
	Linear Striping (4"-6")		\$1.40 - \$28.75	Linear Foot	Varies with quantity.
	Thick Linear Striping (12"-24")		\$5 - \$45	Linear Foot	Varies with quantity.
	Install Small Signs	\$450 - \$500	\$70 - \$875	Each	Varies with quantity and type.
	Relocate Small Signs	\$500 - \$1,000	\$40 - \$2,500	Each	Varies with quantity and sign condition.
	Remove Small Signs	\$90 - \$120	\$55 - \$158	Each	
Pedestrian Bridges	Pedestrian Bridges	\$180 - \$200		Square Foot	
	Prefabricated Pedestrian Bridge (10'x40')		\$63,250	Each	
	Prefabricated Pedestrian Bridge (10'x40')		\$158	Square Foot	
Temporary Traffic Control	Portable Changeable Message Boards	\$10,000	\$2,500 - \$17,000	Each	Quantity and price varies based on project needs. 2 each usual minimum quantity if used.
	Portable Changeable Message Boards		\$65	Day	See Statewide Average Bid Prices. ~20 days/month of Traffic Control if used.
	Truck Mounted Attenuator	\$100 - \$250	\$55 - \$400	Day	~20 days/month of Traffic Control.
Required for all Projects	Barricades, Signs, and Traffic Handling	\$1,500 - \$4,000	\$1,000 - \$12,000	Month	Dependant on Project Traffic Control Complexity
	Mobilization	10%	5% - 10%	Lump Sum	Varies based on project complexity and size.
<b>Supplemental Items (Not from 2019 Program Call Bid Results)</b>					
Bike/Ped Traffic Control	Vehicle Detection	\$2,500		Per Approach	
	Rapid Flashing Beacon	\$100,000	\$95,000 - \$110,000	Each	
	Pedestrian Hybrid Beacon	\$200,000	\$180,000 - \$220,000	Each	
	Pedestrian Project Traffic Control	3%		LS	3% of Total Project Costs

Allowance Ranges					
	Allowances	Recommended	Historical Range	Unit	Notes
Allowances vary depending on project size, schedule, context, and complexity. Not all of these costs apply to every project.	Bridges	>\$100	\$70 - \$765	SF	<a href="#">See most recent BRG Unit Costs at this link.</a>
	Railroad		\$15k - \$500k	Lump Sum	See Railroad Coordination Guidance.
	Allowance for Erosion Control (Seeding/Sodding, Topsoil, Watering, SW3P BMPs, Maintenance)	5%	1% - 11%	Lump Sum	Projects at 60% or greater PS&E completion should replace allowances with calculated quantities.
	Allowance for Earthwork (Excavation, Embankment, Special)	5%	1% - 11%	Lump Sum	
	Allowance for Drainage (Ditches, Drainage Structure Install/Remove)	5%	1% - 20%	Lump Sum	
	Allowance for Signing & Striping	3%	1% - 7.5%	Lump Sum	
Allowance for Electrical Work (Lights, etc)	10%	2% - 20%	Lump Sum		

Contingency					
		Recommended	Range	Unit	Notes
	Contingency for Preliminary Application Estimates	15% - 20%	10% - 30%	Lump Sum	Varies depending on estimate confidence.
	Contingency for Detailed Application Estimates	10%	15% Max	Lump Sum	Varies depending on estimate confidence. Disallowed after 60% PS&E completion.
<i>Preliminary Application quantities should be refined for the Detailed Application. It is strongly recommended to use TxDOT's Bid Item Description Codes.</i>					

**NOTES:**

<sup>1</sup> Above commonly used items (except Bike/Ped Traffic Control Supplemental items) are based on letting results from PTN-awarded Transportation Alternatives Projects from 2019 Project Call (May 2021 - December 2022 Lettings). Pricing recommendations are based on average TA project conditions. Prices can vary due to efficiencies of scale (quantity), location, haul distances, special specifications/provisions, contractor capacity/experience, letting congestion, material availability, and other factors. See Statewide Average Low Bid Prices for more pricing context.

<sup>2</sup> A comparison of the unit prices shown above with Statewide Average Low Bids should reveal that the prices in this tool vary from higher to significantly higher than the statewide averages. This is largely due to the difference in scale between traditional Transportation Alternative (TA) projects and standard TxDOT Highway projects. Since the information in this tool was directly derived from only TA project lettings, it illustrates the potential scale of the difference in prices.

<sup>3</sup> See TxDOT Roadway Design Manual, Chapter 7, Section 3, "Pedestrian Facilities" and Chapter 6, Section 4, "Bicycle Facilities" for applicable Design Criteria. [Link to TxDOT Statewide Bid Item Averages Dashboard.](#)