

Appendix E: Highway Cost Calculation Methodology

Project Cost Estimations

The MPO has amended the methodology used to estimate construction costs to better reflect existing conditions. These costs reflect 2007 dollars. In addition to the following changes, each project has been given an estimated year of construction and the construction costs have been adjusted at a rate of 4% per year to reflect the effects of inflation.

Construction Costs

STEP 1 - RIGHT OF WAY PREPARATION

$(\text{Length} / 100) * \$1,250$

STEP 2 – PAVEMENT REMOVAL (PERMANENT)

$\{(\text{Length} * \text{Current Width}) / 9\} * \7.00

STEP 3 - REMOVE CURB & GUTTERS & SEWERS

$\text{Length} * \$13.50$

STEP 4 - CONSTRUCT ROADWAY (INCLUDES DRAINAGE)

SECTION A – FIRST 2 MILES

Add shoulders - \$500,000 per mile

Reconstruction cost - \$400,000 per lane-mile

Widening - \$1,000,000 per mile for each new lane

Center Turn Lane - \$1,700,000 per mile

Widening from 2 lane to 4 lane with CTL - \$2,000,000 per mile

Replace Center Turn Lane with Median - \$700,000 per mile

Diamond Interchanges - \$6,500,000 each

New highways on new alignments

2 lanes with shoulders - \$3,000,000 per mile

4 lanes with center turn lane - \$5,700,000 per mile

4 lanes with raised median - \$5,000,000 per mile

6 lanes with raised median - \$6,000,000 per mile

4 lane expressway, no frontage roads - \$7,000,000 per mile

4 lane expressway with frontage roads - \$9,600,000 per mile

6 lane expressway, no frontage roads - \$10,000,000 per mile

6 lane expressway with frontage roads - \$12,000,000 per mile

SECTION B – REMAINING MILES

- Add shoulders - \$375,000 per mile
- Reconstruction cost - \$300,000 per lane-mile
- Widening - \$750,000 per mile for each new lane
- Center Turn Lane - \$1,275,000 per mile
- Replace Center Turn Lane with Median - \$525,000 per mile

New highways on new alignments

- 2 lanes with shoulders - \$2,250,000 per mile
- 4 lanes with center turn lane - \$4,275,000 per mile
- 4 lanes with raised median - \$3,750,000 per mile
- 6 lanes with raised median - \$4,500,000 per mile
- 4 lane expressway, no frontage roads - \$5,250,000 per mile
- 4 lane expressway with frontage roads - \$7,200,000 per mile
- 6 lane expressway, no frontage roads - \$7,500,000 per mile
- 6 lane expressway with frontage roads - \$9,000,000 per mile

STEP 5 – DRAINAGE (Installation Only – No travel lane construction)

- Storm Sewers
 - First 2 Miles
 - \$400,000 per mile
 - Remaining Miles
 - \$300,000 per mile
- Bar Ditches - \$50,000 per mile

STEP 6 - CONSTRUCT BRIDGES AND CULVERTS

$\{[(\text{proposed width} + 2) * \text{bridge length}] * 65\} * \text{number of water features}$
Note: Bridge Length includes approaches

STEP 7 - CONSTRUCT SPECIAL BRIDGES

$\{(\text{proposed width} + 2) * \text{bridge length}\} * 100$
Note: Bridge Length includes approaches

STEP 8 - INSTALL CONTINUOUS LIGHTING (URBAN)

\$140,000 per mile

STEP 9 - INSTALL SAFETY LIGHTING (RURAL)

\$12,000 per intersection

STEP 10 - INSTALL TRAFFIC SIGNALS

\$140,000 per intersection

STEP 11 - INSTALL SIGNS

Arterials & Collectors - \$12,500 per mile

Rural Expressways - \$50,000 per mile

Urban Expressways - \$100,000 per mile

STEP 12 - STRIPE ROADWAY

\$7,000 per lane-mile

STEP 13 - SW3P

\$0.12 * total of steps 1 through 12

STEP 14 - MOBILIZATION

\$0.12 * total of steps 1 through 13

STEP 15 - TCP

\$8,000 * construction time in months

Engineering & Right of Way Costs

As mentioned previously, engineering costs have been estimated at 10% of the project's construction cost. Right of way, however, is significantly more variable than engineering and requires a more refined estimation process. The following process was developed in cooperation with the Waco District of TxDOT and the results were compared to projects that have gone to construction within the last 2 years. As with construction costs, both engineering and right of way costs are adjusted by 4% per year to reflect the effects of inflation.

STEP 1 – ESTIMATE NECESSARY RIGHT OF WAY WIDTH

Facility Type	Area	Lanes	Median Type	Frontage Roads	Max Speed	Minimum ROW (Feet)
Collector Major	Rural	2	None	n/a	65	100
Collector Minor	Rural	2	None	n/a	60	100
Collector	Urban	2	None	n/a	30	60
Collector	Urban	4	Center Turn Lane	n/a	30	75
Arterial	Rural	2	None	n/a	65	100
Arterial	Urban	2	None	n/a	30	75
Arterial	Rural	4	Full Restrictive	n/a	70	150
Arterial	Urban	4	Center Turn Lane	n/a	40	90
Arterial	Urban	4	Full Restrictive	n/a	40	100
Arterial	Rural	6	Full Restrictive	n/a	70	175
Arterial	Urban	6	Full Restrictive	n/a	45	120
Arterial	Urban	8	Full Restrictive	n/a	45	150
Arterial	Urban	10	Full Restrictive	n/a	45	175
Expressway	Rural	4	Barrier	No	70	180
Expressway	Rural	4	Barrier	Yes	70	300
Expressway	Urban	4	Barrier	No	60	150
Expressway	Urban	4	Barrier	Yes	60	220
Expressway	Rural	6	Barrier	No	70	210
Expressway	Rural	6	Barrier	Yes	70	325
Expressway	Urban	6	Barrier	No	60	175
Expressway	Urban	6	Barrier	Yes	60	250
Expressway	Urban	8	Barrier	No	60	200
Expressway	Urban	8	Barrier	Yes	60	275

STEP 2 – IDENTIFY QUANTITY OF LAND USES TO BE ACQUIRED

Assumption: Right of Way will be acquired equally from each side of the proposed centerline, unless an obvious physical barrier exists from acquiring right of way from one or the other side (i.e. railroad, water body, development on one side but none on the other, etc.)

STEP 3 – CALCULATE COSTS

Land Use	Cost per Square Foot
Residential	\$5.00
Office / Commercial / Industrial	\$10.00
Platted but undeveloped	\$3.00
Other development (schools, gov't, etc.)	\$4.00
Agricultural within Urban Area	\$1.00
Agricultural outside of Urban Area	\$0.50
All other Land Uses	\$0.25