**Life-Cycle Benefit-Cost Analysis Methodology**

A Benefit-Cost analysis was performed for each submitted project by the Texas Department of Transportation Houston District (TxDOT Houston) with support from Texas A&M University’s Transportation Institute (TTI), using the widely-adopted California Life-Cycle Benefit-Cost Analysis Model (BCA) developed by the California DOT (CALTRANS). The BCA model selected for this task was “Cal-BCv50TIGER\_2014” which was specifically calibrated to be used for the 2014 TIGER Grant applications.

TxDOT Houston and TTI have further calibrated the “Cal-BCv50TIGER\_2014” model to reflect the regional parameters adopted by H-GAC, in terms of:

* General Economic Parameters
* Travel Time Parameters
* Traffic Flow Characteristics Parameters
* Vehicle Operating Cost Parameters
* Accident (Crash) Cost Parameters
* Health Cost of Transportation Emissions

Adjustments were also made to reflect Texas’ statewide crash data by severity type, highway group and roadway type for the most recent three consecutive years of available Crash Records Information System (CRIS) data. Crash reduction factors were derived from the 2013 TxDOT Highway Safety Improvement Program (HISP) Manual and Work Codes Table.

Each project segment was analyzed individually with project-specific geometrics, traffic and crash data and construction costs for a 3-percent discount rate. The results of the BCA are summarized in a table which shows the benefits including travel time savings, vehicle operating cost savings, crash cost savings and emission cost savings. The consolidated life-cycle benefit-cost ratio is also provided.