

US 75 at Collin County Outer Loop Interchange Preliminary Engineering Study

Updated:
September 3, 2013

Purpose

The purpose of the Preliminary Engineering Study is to provide the Collin County Toll Road Authority (CCTRA) with conceptual plan view alternatives that identify proposed preliminary right-of-way (ROW) lines for future project development at US 75 and the Collin County Outer Loop (CCOL) interchange. The Engineer will maximize the use of previous base mapping and survey collected from the schematic and final design development for the CCOL access road from US 75 to SH 121. The Engineer will provide preliminary environmental constraints map update; design criteria table, conceptual interchange layouts; alternative analysis evaluation; cost estimate and traffic operations analysis for the project.

The work described in this scope of services will be paid as lump sum, and include the following major work tasks: Project Management; Data Assembly and Review; and Alignment Studies.

I. Project Management

- A. Perform general management and administration duties required to maintain the project and coordinate with CCTRA, NCTCOG, TxDOT, and other project team members during the development of the project.
- B. The Engineer shall conduct monthly project reviews, update monthly schedules, and prepare monthly invoices for review by CCTRA. Progress reports shall include a brief discussion of the activities conducted during the reporting period and activities planned for the upcoming month, and describe any problems or delays encountered and remedial actions needed or exercised to alleviate the same.
- C. The Engineer shall attend up to three (3) project team meetings with CCTRA. The purpose of these meetings is to evaluate the project status and provide input on draft deliverables
- D. The Engineer shall provide Quality Control and Quality Assurance processes for each deliverable submitted to CCTRA. The Quality Control process shall specify detailed review, checking, back checking and documentation procedures to be performed for every plan, calculation and report and document prepared for submittal. The Quality Assurance process shall provide verification and documentation that the Quality Control processes were adequately performed through the incorporation of reviews, checklists, audits and corrective measures.

II. Data Assembly and Review

A. The Engineer shall collect, review, and update map information within the study area to provide an updated Environmental Constraints Map for up to two (2) submittals. The Engineer shall request the following current data to be provided by CCTRA:

- Digital aerial images
- Thoroughfare Plan
 - Future Highways and Major Arterials
- City and County Boundaries
- Railroad
- Roads
- Contours (2ft)
- Tier 2 Hazardous Material Sites
- Watersheds
- River and Streams
- County Parks
- Watersheds
- Schools and cemeteries
- Appraisal District Parcels

B. The Engineer shall request the following information from TxDOT on behalf of CCTRA:

- Approved 2008 Schematic along US 75 from Telephone Road to County Line Road (Grayson County Line)
- All available electronic files (pdf, dgn, gpk, dtm)

The Engineer shall compile all base mapping information provided by CCTRA and TxDOT and update the existing DTM from the CCOL PSE survey.

III. Alignment Studies

A. The Engineer shall prepare a geometric design criteria table in accordance with the latest version of the TxDOT Roadway Design Manual and the AASHTO Policy on Geometric Design of Highways and Streets.

B. The Engineer shall develop up to two (2) conceptual interchange alternative layouts in plan view only. The conceptual alternatives will be developed on colorized 200 scale rolls with available aerials and planimetric topo for base mapping. The Engineer shall develop up to two (2) submittals of each conceptual alternative. The conceptual alternatives shall contain the following:

- Horizontal alignments and curve data
- Pavement edges, face of curbs and shoulder lines, striping
- Typical sections of existing and proposed roadways
- Proposed bridge limits
- Preliminary ROW requirements and control-of-access locations
- Direction of traffic flow and the number of lanes on all roadways
- Traffic Data if available
- Profiles will not be included
- Retaining wall limits will not be included
- Super-elevation will not be included
- Large guide signs will not be included
- Drainage analysis will not be included
- Cross-sections for earthwork will not be included
- Traffic Control Phasing will not be included

C. The Engineer shall develop an alternative analysis matrix for up to two (2) submittals based on the following:

- Perform an initial assessment of right-of-way impacts to properties along each alignment.
- Evaluate interchange construction feasibility.
- Evaluate access considerations with respect to the locations of slip ramps and direct connector ramps.
- Assess impacts to existing major utilities through the use of GIS to identify potential conflicts.

D. Once a technically preferred conceptual alternative has been selected by the County, the Engineer shall develop a conceptual level assessment of probable construction cost for the project using the current TxDOT average unit bid prices of the State bid items. The conceptual level assessment shall be determined from estimated quantities and unit costs of major construction items, including preparing ROW, pavement, bridge/retaining wall structures and ROW. A contingency shall be added to the estimate to account for items not detailed in the conceptual level assessment. The Engineer shall make up to two (2) submittals of the cost estimate.

E. Once a technically preferred alternative has been selected by the County the Engineer shall perform a detailed level-of-service (LOS) analysis using Highway Capacity Software (HCS) for the project using the design year traffic provided by the North Central Texas Council of Governments (NCTCOG). The LOS analysis will be provided for the design year only. A summary memo with traffic line diagrams will be prepared documenting the LOS results for up to two (2) submittals.

Summary of Deliverables for each submittal:

- Two (2) hard copies and one (1) electronic PDF of the environmental constraints map
- Five (5) hard copies and one (1) electronic PDF of the design criteria table
- Two (2) hard copies and one (1) electronic PDF of the conceptual alternative layouts
- Five (5) hard copies and one (1) electronic PDF of the alternative analysis matrix
- Five (5) hard copies and one (1) electronic PDF of the cost estimate
- Two (2) hard copies and one (1) electronic PDF of the LOS memo