

**Collin County
Lake Lavon Bridge Route Study
From FM 1378 to SH 78**

March 5, 2009

Purpose

The purpose of this contract is to provide Collin County with the Advanced Project Development and ROW Documentation Services necessary to determine the preferred route location of a major 6 lane divided thoroughfare across Lake Lavon from FM 1378 to SH 78 in southeastern Collin County, approximately 9 miles. HNTB Corporation (the Engineer) will develop various geometric alignments within the study area, evaluate the alignments based on the project criteria, and then recommend a technically preferred alignment for approval. After the alignment has been approved by Collin County, the Engineer will provide adequate right-of-way (ROW) documentation necessary for future project development.

Details

- The route study will maximize use of previous study efforts used to develop the Collin County Mobility Plan 2007 Update.
- The Engineer will use available aerial images provided by Collin County. The Engineer will use DTM project mapping based upon the 2001 or most recent North Central Texas Council of Government (NCTCOG) digital elevation model (DEM) contours. The DEM shall be converted to a Geopak .tin to be used as the DTM project mapping. Any survey information excluding what will be provided by the County will be considered as additional services.
- Up to eight (8) horizontal alternative alignments, 120-feet in width, will be developed and evaluated to determine a recommended technically preferred alignment.
- The alternative alignment will be compared based on an evaluation matrix with environmental, engineering, cost and public input criteria.
- This scope of services provides for up to two (2) Public Meetings to be held at the direction of Collin County during the study and a final Public Hearing at the conclusion of the study.
- 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/Develop Constraints Map; Define Design and Evaluation Criteria; Alignment Studies; Right-of-Entry; and Public Involvement.

This scope of services and fee proposal is based on the following time frame for the major work categories:

Data Assembly and Review/Develop Constraints Map - 4 months

Develop Alternative Alignments and Documentation – 6 months

Prepare Draft Report, Incorporate Comments, and Prepare Final Report - 2 months

I. Project Management

- A. Perform general management and administration duties required to maintain the project and coordinate with Collin County, NCTCOG, Texas Department of Transportation (TxDOT), U.S. Army Corps of Engineers (USACE), North Texas Municipal Water District (NTMWD) the adjacent cities (Lucas, Parker, Saint Paul, Wylie, Lavon, Nevada, Josephine); property owners, and other project team members during the development of the project. Six (6) coordination meetings are estimated for the project duration. Prepare a project schedule. Perform quality assurance and quality control activities.
- B. Conduct a kick-off meeting with Collin County to define the study area, discuss the work plan for the corridor, and obtain input to refine the work plan to best meet project needs. Discuss the project schedule and identify adjustments. Discuss the availability of applicable baseline data from Collin County and other agencies. Other items of discussion will include agency contact for collection of baseline information, Collin County preference regarding notification for agency meetings and project communication methods. Prepare a memorandum summarizing the items of discussion.
- C. Attend project team meetings with Collin County as needed. The purpose of these meetings is to evaluate the project status, determine necessary adjustments to the project work plan and schedule, plan upcoming events, and to discuss and resolve key project issues. Six (6) project team meetings are estimated for the project duration.

II. Data Assembly and Review/Develop Constraints Map

The initial tasks will be to collect data and to research and identify significant issues that potentially influence the location and selection of the technically preferred alignment.

- A. Collect, review, and map information within the study area. This information will be obtained from appropriate local, regional, state, and federal resources and site investigations. Review the digital aerial images obtained from Collin County and other aeriels (i.e. color infrared) from other available sources. Baseline data collected will be stored and managed in a Geographic Information System (GIS). The GIS data will be distributed in Shapefile or Personal GeoDatabase format. With the assistance of GIS, this information will help identify environmental and design constraints that could influence alternatives or provide opportunities. GIS data management includes the following subtasks:

1. GIS Data Gathering and Coding: Contact public agencies and organizations to obtain applicable GIS layers and databases and potential alignments to be coded in the system
2. GIS Data Manipulation and Integration: Check data for consistency and update if necessary.
3. GIS Output: Develop maps and graphics (JPEG or PDF) for analysis and presentation.

Current Data if Available from the NCTCOG (to be field verified as needed):

- FEMA Q3 maps
- NCTCOG Mobility 2030 Plan, 2007 Update Recommendation
- Abandoned Landfills
- List of Park and Recreation Facilities
- Zoning
- Present and Future Population and Employment

Current Data if available from Collin County (for Collin County only)

- 2007 digital aerial images (6" resolution)
- NCTCOG Mobility 2030 Plan (has been incorporated into Collin County's thoroughfare plan)
- Collin County Mobility Plan 2007 Update
- Future Highways and Major Arterials
- City and County Boundaries
- Railroad Alignments (are available in the Collin County's appraisal district parcels layer)
- Roads
- Tier 2 Hazardous Material Sites
- Watersheds (DEM 10-30 meter)
- River and Streams
- County Parks
- Watersheds
- Regional Thoroughfare Plan
- Schools and cemeteries
- Tax Records
- Property Boundaries and Ownership

Data to be collected if available:

- Archeological and Historical Sites
- Future Land Uses
- Present and Planned Major Generators
- Present and Future Trip Patterns
- Regional and City Thoroughfare Plans
- Proposed development plans

- Traffic Count Data
- Major Utility Alignments
- Wildlife Habitats
- Related Corridor Studies
- Churches
- Hazardous Material Sites (Database Search)

B. Evaluate the adequacy of existing data and determine the extent of field investigations needed to collect additional baseline data. Following review of the aerial photography, conduct field reconnaissance as needed to identify and confirm potentially sensitive areas or physical resources within the project area including: wildlife habitats, potential habitat for threatened or endangered species and Section 404 jurisdictional waters of the U.S./wetlands, and potential sites containing hazardous materials (records search). Photograph potentially sensitive areas during the initial field reconnaissance. Global Positioning System (GPS) will be used during field reconnaissance so that data can be quickly and accurately stored in the GIS. The initial evaluation for archeological resources will consist of a review of the National Register of Historic Places and coordination with the Texas Archeological Research Laboratory to perform a database review to determine if recorded archeological sites exist within the study area. Similarly, an historic resources evaluation will be performed to determine the existence of historic features within and adjacent to the study area and will also involve limited field reconnaissance. Dependent upon the results of these investigations, additional services may be required including an archeological impact evaluation or pedestrian survey and coordination with the Texas Historic Commission (i.e. Texas Antiquities Code permit, etc.).

C. Prepare Constraints Map which identifies potential sensitive areas such as cemeteries, churches, hazardous material locations, and parks, etc. for use in identifying alternative alignments. Locate critical environmental resources on the constraints map. Update the GIS database established as needed and use the database to quantify and evaluate impacts to sensitive resources and graphically illustrate impacts in the evaluation of alternatives.

1. Identify which features may be impacted (e.g., wetlands, historic structures, steep terrain).
2. Define how these features will be impacted.
3. Overlay the impact definitions for all the potentially impacted features. Update map to show areas where, if the alignment should be routed over, an impact will occur. This map will allow quick visual analysis of paths of least impact through the study area. The constraints map will show areas that should be avoided, due to

potential impacts to a feature (e.g., wetlands, historic structures, etc.).

Deliverables:

GIS data in electronic format

Photographs of project area (as applicable)

Constraints Map (Up to ten (10) hardcopies and electronic file)

III. Define Design and Evaluation Criteria

- A. Establish evaluation criteria to ensure the unbiased evaluation of alignment alternatives. In coordination with Collin County, develop and define the design standards. Review and summarize the list of categorized issues into a set of criteria to be used in the matrix evaluation for the analysis, evaluation and screening of alternative alignments. Define the major issues of environmental, engineering, cost and public input into more detailed evaluation categories.
- B. Document technical methodologies and procedures for alternative analysis evaluation. Quantitative and qualitative criteria and/or measures of effectiveness will be summarized in a comparative form for each issue. Develop a specific set of project planning criteria for approval by Collin County. Conceptual development of the alternative alignments will be based upon these approved criteria.

Deliverables:

Design and Evaluation criteria (Up to ten (10) hardcopies and electronic file)

Technical methodologies and procedures comparative form (Up to ten (10) hardcopies and electronic file)

IV. Alignment Studies

Identify and develop alternative alignments within the study area each approximately 120 feet wide (Based on Collin County Mobility Plan 2007 Update for a 6 lane divided section). Each alignment will be analyzed utilizing information collected in Task II. The alignments will be selected based on environmental impacts, engineering feasibility, cost, and public input. Due consideration will be given to existing and proposed development, future land use, environmental factors, geographic features, community support, and costs in identifying potential alternative alignments:

- A. Using the data obtained in Task II, identify and develop alternative alignments to determine ROW needs.
 - 1. Develop up to eight (8) horizontal alternative alignments within the corridor using approved design criteria, data collection, constraints, and opportunities identified during field reconnaissance. The

alternative alignments will be depicted on exhibits that utilize aerial images and GIS layers as base mapping data. The GIS layers will generally consist of parcels, streams, lakes, existing roads, proposed thoroughfare roads, subdivisions, contours, and sensitive environmental features.

2. Based on the viability of the horizontal alternative alignments, the Engineer will develop profiles for up to two (2) of the alternative alignments. The profiles will be depicted on plan and profile roll plot exhibits. The plan and profile roll plot exhibits shall be colorized at a scale to be determined consisting of the following elements:
 - a) Label streets, buildings, and parcels
 - b) Proposed centerline
 - c) Horizontal Curve Data (PC, PT, PI, Curve Length, Bearing, Degree of Curve)
 - d) Proposed ROW
 - e) Retaining walls (if needed)
 - f) North arrow
 - g) Direction of traffic flow (via arrows) on all roadways/typical sections.
 - h) Centerline profile
 - i) Vertical Curve Annotation (PVC, PVI, PVT, Curve Length, Grades, K values)
 - j) Proposed elevations (0.00) and existing elevations (0.0)
 - k) Proposed Typical Section
 3. Cost estimates for up to two (2) of the alternative alignments will be developed at a quantitative/feasibility level. A detailed preliminary cost estimate will only be prepared for the approved alignment. The preliminary cost estimate will be determined from estimated quantities and unit costs of major construction items including preparing ROW, pavement, and structures. The unit costs will be obtained from similar projects of scope and complexity. A contingency will be added to the preliminary cost estimate to account for items not listed in the cost estimate. Preliminary earthwork cross-sections will not be developed.
- B. Analyze key environmental, engineering, cost, and public input affecting the feasibility of each alignment. Perform a comparative evaluation of the alternative alignments. Develop a definition of impacts for each feature impacted by the alignment. Prepare a tabular summary documenting the alignment analysis. This table will summarize the degree of impact (e.g., no impact, minimal impact, or major impact) for each alignment alternative and each feature.

1. Perform additional environmental analysis to refine the preliminary data within the corridor for each alternative alignment. All additional data collected during environmental field studies will be used to update the GIS to ensure the GIS contains the most current and accurate information for the project.
 2. Perform an initial assessment of ROW impacts to properties along each alignment. Assemble ROW impacts for each alignment and summarize impacts by individual owner and parcel in tabular form.
 3. Evaluate access interruptions and construction feasibility to maintain access during an initial access study. Consider improvements to existing roads or extending existing roads to maintain access in construction cost estimate.
 4. Assess impacts to existing utilities. Research existing overhead and underground utilities, prepare overlays in the GIS to depict the relationship of the utilities to the proposed alignment alternatives and identify potential conflicts.
 5. Develop preliminary ROW and utility relocation costs estimates for each alignment based on costing methodology approved by Collin County. Analyze the topographic constraints for each alignment and impact on construction costs. Prepare a comparative analysis of construction costs.
- C. Identify the feasible alignments based on 1) Collin County and adjacent city input, and 2) review of analyses conducted by the project team. Consideration will be given to environmental, engineering, cost, and public input criteria. The team, in conjunction with Collin County, will examine the priority of the evaluation matrix factors. Following this prioritization of the evaluation factors, the study team will rank the alternatives in order of their ability to meet evaluation criteria. The project team's identification of feasible alignments will be presented to Collin County. Once an alternative alignment has been approved by Collin County, a Route Study report will be developed to document all of the project's need and purpose, process, analysis, as well as the conclusion and recommendations.

Deliverables:

- Alternative Alignment exhibits overlaid on aerial images (Up to five (5) hardcopies for each alternative and electronic file)
- Plan and profile exhibits (Up to five (5) hardcopies for each alternative alignment and electronic file)
- Environmental Evaluation Summary
- ROW Needs Tabular Summary

- Comparative Cost Analysis
- Alignment Evaluation Matrix
- GIS data in ESRI's Shapefile or Personal GeoDatabase format (NAD83 State Plane North Central Zone) compiled as a project in ArcGIS
- Lake Lavon Bridge Crossing Study Report (Up to ten (10) hardcopies and electronic file)

V. Right-of-Entry (ROE)

A. Right-of-Entry (ROE) for Data Collection

1. Prepare ROE letters as required by Collin County to allow access by project team members to adjacent private property to establish GPS targets and perform environmental analysis as may be required for the alignment evaluations. Property owners will be contacted initially by mail. If after sending out one (1) mailing and attempting to contact by telephone there are some property owners that are non-responsive, field personnel will hand carry ROE letters to the location of the subject property in the study area to attempt to obtain permission. In the event that access is denied from owners contacted or responses are not received after several attempts to contact the property owner, the Engineer shall contact Collin County for assistance to secure access. Up to twenty (20) ROE letters are estimated for the project duration.

VI. Public Involvement

Assist Collin County with the planning and coordination of two (2) public meetings at key study milestone dates. The two public meetings will be held at interim points during the study. A final public hearing will be held at the conclusion of the study to allow for presentation of study results and final public comment to the Collin County Commissioners Court.

A. Public Meetings

1. Assist Collin County with public meeting coordination and logistics. This will include preparing and distributing the postcard notification to stakeholders, coordinating meeting sites and accompanying audio/visual equipment, and room setup and breakdown. *Collin County will create the legal advertisement and coordinate the advertisement with appropriate local newspapers.*
2. Develop project up to six (6) exhibit boards, PowerPoint presentations, agendas, comment cards, speaker cards, graphics and other presentation materials.
3. Attend, facilitate and take notes at each public meeting. Attendance will be limited to four (4) attendees.
4. Develop a project database for the Collin County Lake Lavon Bridge Crossing Route Study. Maintain and update the database to include elected/local

officials and stakeholders. The database will serve as the project mailing list for the project.

5. Compile and analyze comments received at the two public meetings and public hearing to assist in the evaluation of the alternatives. Provide a summary of verbal comments from each public meeting to be included in the public meeting summary.
6. Prepare a public meeting summary for each public meeting. Four (4) copies of each summary will be created and provided to the County.
7. Coordinate with Collin County Public Information Office to disseminate information to the public via the Collin County Web site and other methods as determined by Collin County.

B. Public Hearing

1. The Engineer will prepare and develop materials for the public hearing, including a PowerPoint presentation and supporting handouts.
2. The Engineer will attend and present at the public hearing. Attendance will be limited to three (3) attendees.