

Scope of Services for Phase 2 of the Collin County Future Mobility Study

Phase 2

This project provides for the development of recommended improvements and route studies for the Collin County Future Mobility Study. Burns & McDonnell shall provide the following services to the County regarding the study:

- ▶ Origin & Destination Study
- ▶ Infrastructure Assessment
- ▶ Route Studies
- ▶ Conceptual Plans
- ▶ Alternatives Analysis
- ▶ Travel Demand Modeling
- ▶ Environmental Review
- ▶ Public/Stakeholder Involvement
- ▶ Project Recommendation Plan
- ▶ Right-of-Entry Agreements

Phase 2 is defined as the identification of recommended improvements and route studies. During this portion of the study the study team will develop and advance reasonable alternatives through conceptual design and determine the appropriate level of environmental documentation to support future project implementation decisions and the potential use of federal funding.

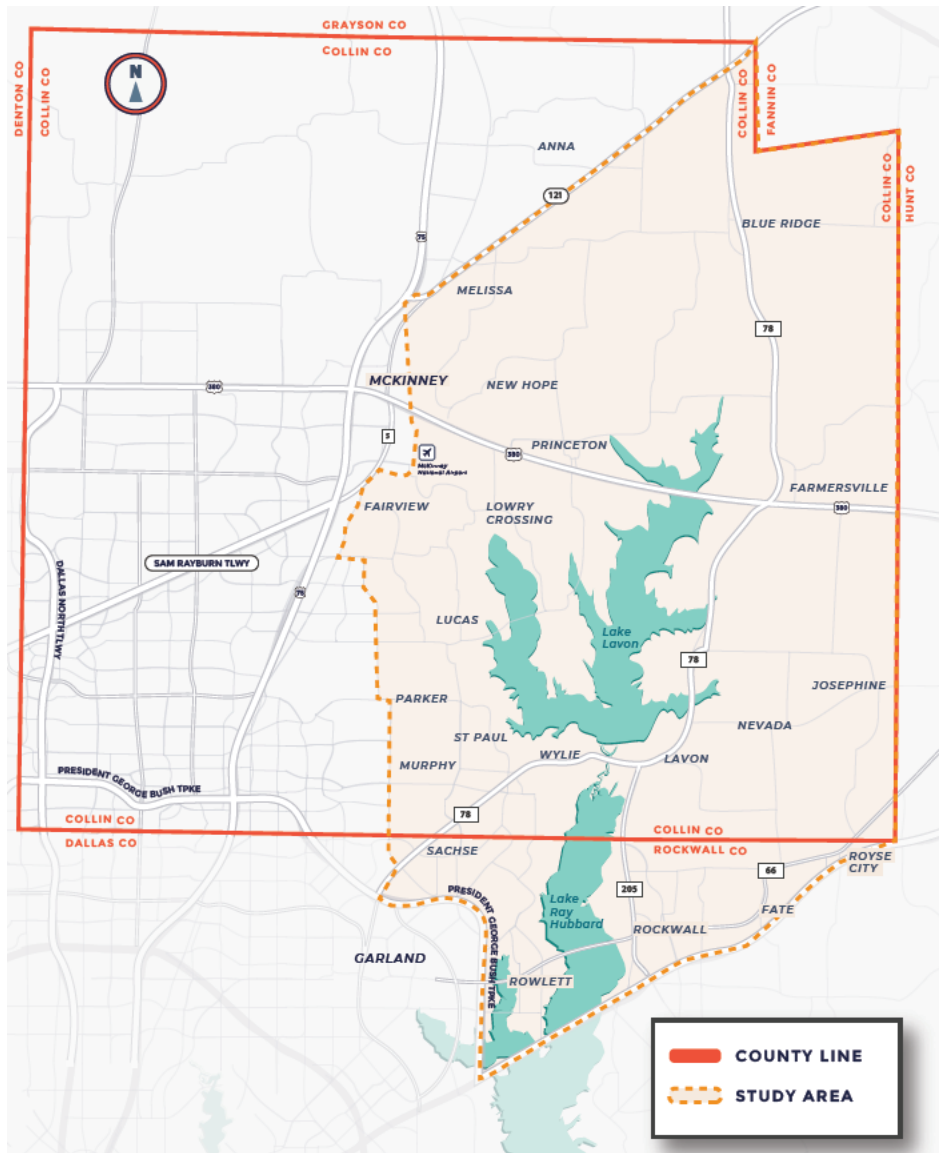
The total estimated cost of Phase 2 of the project is **\$2,473,017.81**.

Overview

Task 1	Project Management and Quality Control
Task 2	Data Collection and Analysis
Task 3	Arterial/Infrastructure Assessment and Evaluation
Task 4	Roadway Geometric Route Studies
Task 5	Traffic Modeling
Task 6	Environmental/Public and Stakeholder Outreach
Task 7	Project Recommendation Plan

Project Details

The project Study Area will be bounded by I-30 on the south, SH 121 on the north, and the Collin County/Hunt County line on the east. The western boundary is made of a combination of PGBT, SH 78, FM 2551, SH 5 and Airport Blvd. A map of the project limits can be seen below denoted by the white boundary line.



TASK 1: PROJECT MANAGEMENT AND QUALITY CONTROL

- ▶ The Engineer shall provide project management and oversight of identified studies and coordinate all technical issues with the County for the duration of this Contract based on the scope provided.
- ▶ Project Management Plan
 - The Engineer shall develop, prepare, and deliver a Project Management Plan (PMP) that clearly defines direction, responsibilities, and project objectives which includes the following components:
 - Outlines how commitments of project shall comply with County standards
 - Identifies roles and responsibilities of key staff within the project organizational structure
 - Provides and maintains contact information for principal points of contact, core project team members, and participating stakeholders
 - Provides a process for developing and detailing work to be accomplished
 - Defines risk management and issues management processes
 - Provides invoicing and status reporting procedures.
 - Includes master schedule
 - Includes Quality Assurance/Quality Control Plan as described below
- ▶ Progress Reports
 - The Engineer shall submit a written progress report to the County indicating the previous work completed to date, actual work accomplished during the month, scheduled work to be accomplished for that month, and the estimated work to be accomplished for the following month.
- ▶ Project Invoicing
 - The Engineer shall prepare and submit to the County an invoice consolidating all work performed. The Engineer shall invoice in accordance with the rate schedule and function codes authorized in the contract.
- ▶ Coordination Calls/Meetings
 - The Engineer shall schedule and conduct up to ninety (90) meetings, conference calls or WebEx meetings with the County and the core project team. The Engineer shall use these conference calls and meetings to determine project objectives, critical path milestones, and to identify and mitigate risks to project schedule, budget, or objectives. The Engineer shall include selected minor task leads, content specialists, and project participants to provide comprehensive communications on meeting topics.
 - The Engineer shall prepare, schedule, conduct, and document up to twenty-five (25) technical coordination meetings throughout the development of the project including meetings with NCTCOG, Collin County, NTTA, and teams working on other County projects. The Engineer shall plan and carry out these meetings, to promote clear communication and keep all participants, including any technical committees, well informed of the progression of project objectives. The Engineer shall provide summaries of each meeting.
- ▶ Project Schedule
 - The Engineer shall create and maintain a project work schedule.
- ▶ Oversee subconsultant services
 - The Engineer shall prepare subconsultant agreements and oversee subconsultant services.
- ▶ Quality Assurance / Quality Control Plan
 - The Engineer shall develop and distribute a Quality Assurance/Quality Control (QA/QC) Plan to define a quality control program and specific quality control practices. The Engineer shall maintain the QA/QC Plan throughout the duration of the project and shall describe the scope of services, identify the task and sub-task responsibilities of team members, and define the formats for all memos, reports, graphics, mapping, and operational procedures for the project.
 - The Engineer shall review all work to ensure it is performed in accordance with County requirements. The Engineer shall provide a copy of the quality control review of the major work product submittals showing the comments, corrections, and changes made prior to the County review.

TASK 2: DATA COLLECTION AND ANALYSIS

- ▶ The Engineer shall collect documents and process data for existing and proposed development plans, thoroughfare plans, and land use maps in the study area from local municipalities and local ordinances related to project development.
- ▶ The Engineer shall collect and analyze relevant environmental data, including major existing and future utilities, and update the GIS datasets and update environmental constraints map.
- ▶ The Engineer shall conduct limited field reconnaissance and collect data including a photographic record of notable existing features. The Engineer shall obtain right of entry (ROE) for select critical parcels.
- ▶ Data collection shall include:
 - Proposed development plans from cities
 - Collin County Master Thoroughfare Plan and Master Thoroughfare Plans from cities
 - Major Existing and Future Utilities
 - Adopted land use maps and plans from cities, as available
 - GIS datasets from Collin County, TxDOT, NCTCOG, USACE and local entities
 - Plans from Independent School Districts
 - Texas Water Development Board (TWDB) Population Projection Updates
 - 2020 Census Data
 - NCTCOG's Regional Metropolitan Transportation Plan (MTP), Mobility 2045
 - NCTCOG's Collin County Transit Study
 - Collin County Regional Trails Master Plan
 - Current Projects within the Study Area – TxDOT, Municipalities, Collin, Dallas, & Rockwall Counties

TASK 3: ARTERIAL/INFRASTRUCTURE ASSESSMENT AND EVALUATION

- ▶ Origin/Destination Study
 - The Engineer shall review and analyze the Origin & Destination (O&D) data received from Mobelity for the study area. This data shall be used to support and influence the recommended refinements to the Thoroughfare Plan and Traffic Modeling in Task 5.
 - The Engineer shall update Power BI site summarizing the study data.
 - The Engineer shall produce "Flying Car Map" for all cities within the study area.
- ▶ Future Arterial Assessments
 - The Engineer shall evaluate the current thoroughfare plans for Collin County, Rockwall County, Hunt County, and Dallas County and for cities within the study area. The Engineer shall recommend high-level refinements to the Collin County Thoroughfare Plan, which may include adjustments to spacing of arterials and eliminating arterials from the plan.
 - The Engineer shall update the Collin County Thoroughfare Plan based on recommended refinements.
 - The Engineer shall evaluate roadway needs and possible improvements based on feedback received from Phase 1 Public Meeting. Recommendations may include improvements to local streets and thoroughfares, additional thoroughfares, and potential freeway routes. The Engineer shall:
 - Provide a summary table with priority list and timeframe for when improvements may be needed.
 - Identify overcapacity thoroughfares and capacity needed (i.e., number of lanes).
 - Consider impacts to northeast Collin County.
- ▶ Planning Roadmap
 - The Engineer shall evaluate and prepare a roadmap of the ability or restrictions for cities and counties to preserve areas needed for future improvements or corridors/ROW. The roadmap shall clearly illustrate the need for long-term planning.

TASK 4: ROADWAY GEOMETRIC ROUTE STUDIES

▶ Freeway Alignment Alternatives

- Refine NCTCOG Alignments
 - The Engineer shall further develop conceptual geometry for two (2) SH 78 Lavon-Hubbard Parkway alignments previously developed by NCTCOG, described hereinafter as draft build concepts. Conceptual geometry shall consist of centerline alignment(s) updated to meet current design criteria and shall consider data collected in Phase 1.
- The Engineer shall develop and review a range of up to three (3) additional freeway alignments, described hereinafter as draft build concepts, which will attempt to avoid or minimize displacements, damages and environmental impacts within the study area. A build concept constitutes a single alignment from project beginning to end, that identifies a preferable route in which some of its segments may not be exclusive to a single build concept.
- The build concept layouts will attempt to identify potential adverse impacts within the project corridors including all major existing and proposed utilities (public and private), structures, burial grounds, neighborhood communities, historical landmarks, and developing areas (residential and commercial) based on a desktop study.
- The Engineer shall prepare layouts on 11"x17" sheets containing the following data:
 - Plan view centerline alignments of the build concepts
 - Pending and future known developments mapped in plan view as determined in Task 2
 - Proposed ROW swaths of the build concepts based on a standard offset from the centerline
 - Major grade separated interchanges identified with symbols
- The Engineer shall furnish MicroStation V8i or Geopak computer generated media containing the roadway schematic layout.

▶ Arterial Improvements

- The Engineer shall develop high-level geometrics for specific areas. The specific areas will be determined based on assessment and evaluation of infrastructure in Task 3. Due to open-ended nature of this task, the specific areas of review shall be limited to 1000 hours. Specific areas may include, but are not limited to:
 - Connection from east of the lakes to PGBT or US 75
 - SH 78 Lavon-Hubbard Parkway across Lake Ray Hubbard
 - Along existing SH 78 east of Lavon Lake
 - FM 544/Plano Parkway Relief
 - SH 205 – from SH 78 to I-30
 - Alternate Truck Routes
 - Connectivity Improvements – i.e., minor arterial improvements, intersection alternatives, realigning offset intersections, FM 1378/County Club Rd @ Merritt Rd
- The Engineer shall prepare layouts on 11"x17" sheets (up to 20 layouts) containing the following data:
 - Plan view centerline alignments
 - Conceptual Geometry
 - Pending and known future developments
 - Proposed ROW lines

▶ Freeway Alignment Alternatives Analysis and Evaluation Matrix

- The purpose of this task is to screen and evaluate improvements that satisfy the identified needs and purpose of the project. This effort shall build on any previous work completed for the corridor, as applicable. The Engineer shall develop a screening and evaluation process to vet the corridors.
 - Comparative qualitative screening and quantitative evaluation of build concepts outlined in Freeway Alignment Alternatives.
 - Evaluation categories shall be based on the preliminary need and purpose as defined in Task 6.

- Build concepts shall be analyzed using the agreed upon criteria while attempting to avoid and minimize, where feasible and practicable, impacts to sensitive resources and protected features.
- The criteria shall consider minimizing irreversible and irretrievable commitments of resources, relocations and permit complexity.
- The criteria may take into consideration or include the following:
 - Existing and future residential and commercial areas
 - Socioeconomic impacts
 - Potential displacements
 - ROW costs
 - Utilities
 - Construction costs
 - Public input
 - Land use
 - Traffic LOS Improvement
 - Safety
 - Mobility and Connectivity, including freight
 - Wetlands / Waters of the U.S.
 - Wildlife habitat
 - Floodplains
 - State or federally listed threatened or endangered species
 - Historic and archaeological assets
 - Cemeteries
 - Hazardous waste sites
 - Other environmentally sensitive sites as identified during the route study process
- The Engineer shall develop an evaluation matrix to compare and evaluate each build concept.

TASK 5: TRAFFIC MODELING

▶ Data Collection

- The Engineer shall analyze origin-destination data from Phase 1 of the project to understand travel patterns in Collin County and calibrate and validate the external zones of the travel demand model.
- The Engineer shall summarize existing traffic counts within the study area using available data sources such as TxDOT and NCTCOG.
- The Engineer shall use available data to document existing conditions of Collin County thoroughfares within the study area, including number of lanes and posted speed limits. Field data collection will not be performed.
- The Engineer shall coordinate with NCTCOG to obtain relevant base and forecast year traffic data. Anticipated data supplied by NCTCOG are: Base Year Validation Model Network, Existing + Committed 2028 and 2045 Model Network, and Build 2028 and 2045 Model Network. The Engineer shall review the data provided by NCTCOG.

▶ Base Year Travel Demand Model

The Engineer shall develop a sub-area model based on the NCTCOG Travel Demand Model (TDM) to cover the study area limits. The model shall be based on general parameters from the NCTCOG TDM (trip rates, population and employment densities, speed adjustments, etc.). The following tasks shall be performed:

- The Engineer shall develop base year model highway network of Collin County thoroughfares within the study area as identified in the current Collin County Thoroughfare Plan (MTP). The model shall be based on aerial photography and data provided.

- The Engineer shall develop base year traffic analysis zones (TAZs) within the study area limits, using the Master Thoroughfare Plan as a basis for the zone boundaries. The Engineer shall code centroid connections from the TAZs to the model highway network.
- The Engineer shall develop base year demographics (households, population, employment) for the TAZs. Trip production rates shall be based on the NCTCOG TDM and refined for the sub-area model using the National Household Travel Survey (NHTS) 2017 data.
- The Engineer shall identify external station locations. Using origin-destination data from Phase 1 of the project, external trip characteristics will be evaluated. The number of base year vehicle trips at each external station will be set equal to the ground counts at those locations. Autos and trucks (single-unit and combined-unit) shall be modeled separately based on available vehicle classification counts. The Engineer shall develop directional split factors based on ground counts at each external station. A K-factor matrix shall be developed for the external-external trip distribution gravity model for distribution of through trips between external stations.
- External-internal trips are assumed to be produced at external stations and attracted to internal zones and shall be derived at the TAZ level based on employment categories and total number of households. A gravity model shall be used to distribute trips from external station to internal TAZs.
- The base year traffic assignment shall be run using TransCAD.
- The Engineer shall perform calibration and validation of the base year model, based on NCHRP Report 716 – *Travel Demand Forecasting: Parameters and Techniques* and the *Travel Model Validation and Reasonableness Checking Manual, Second Edition*.

The calibration and validation process shall involve adjusting model trip production rates and centroid connector locations. The following key comparisons shall be made during the calibration and validation process:

- Overall person trip rate per capita and per household;
- Person trip rates for each trip purpose;
- Percent of total trips for each trip purpose;
- Average trip length, trip length frequency distribution, and percent intrazonal trips for each trip purpose;
- VMT per capita and per household; and
- VMT by facility type and by functional classification.

The following measures shall be evaluated by comparing model results with observed traffic counts:

- Coefficient of determination (R square);
- Percent Root Mean Square Error (RMSE) area wide, by volume group, and by functional classification;
- Percent difference of volume by facility type;
- Percent difference of volume by volume group; and
- Percent difference of volume at screen lines and cut lines.

The Engineer shall prepare a calibration and validation memo to document the results of the base year model. Model output files shall be provided. Individual maps shall be prepared detailing the model highway network (number of lanes and functional classification), TAZ demographics, and total model volumes.

► Base Future Year Travel Demand Model

As part of this task, the Engineer shall develop a base future year travel demand model that covers the study area limits, using the model developed as part of the previous task as a base. The following tasks shall be performed:

- The Engineer shall develop a future year model highway network to include Collin County thoroughfare roadways within the study area at full build-out.
- The Engineer shall develop build-out demographics of all TAZs within the study area based on specific development information provided by Collin County for known developments and forecasted demographics for undeveloped parcels using the Collin County 's future land use plan.
- The NCTCOG 2040 travel demand model shall be used to adjust the external zone target volumes to ensure that adjacent regional roadway projects are accounted for in the sub-area model.

- The Engineer shall run the Base Future Year travel demand model and provide the output files. Individual maps shall be prepared detailing the model highway network (number of lanes and functional classification), TAZ demographics, and total model volumes.

▶ Modified Future Year Travel Demand Model

As part of this task, the Engineer shall develop a modified future year travel demand model that covers the limits of Collin County, using the model developed as part of the previous task as a base. The model highway network shall be updated to reflect the roadway network for up to two (2) alternatives. The following tasks shall be performed:

- The Engineer shall modify the model roadway network to include the roadway network for up to two (2) alternatives.
- The Engineer shall use the build-out demographics of all TAZs within the study area based on the previous task.
- The Engineer shall run the Modified Future Year travel demand model and provide the output files. Overall maps shall be prepared and provided detailing the model highway network (number of lanes and functional classification), TAZ demographics, and total model volumes. A memo shall be prepared to discuss and compare the results of the alternatives using modified future year travel demand modeling.

TASK 6: ENVIRONMENTAL/PUBLIC AND STAKEHOLDER OUTREACH

▶ Public and Stakeholder Outreach Plan

- The Engineer shall update the public and stakeholder outreach plan from Phase 1. The plan will set goals for the public involvement process, identify stakeholders (i.e., elected officials, agencies, community organizations, and Environmental Justice and Limited English Proficiency populations), and establish strategies that will be used to engage the public and stakeholders during the project. The plan shall be revised as needed throughout the process to appropriately document the need for the project.

▶ Stakeholder Outreach

- The Engineer shall conduct and make arrangements for agency (i.e., NCTCOG, TxDOT, USACE) stakeholder meetings, including preparation of meeting agendas, presentations, materials and exhibits to be used during meetings. The Engineer shall submit documents to the County for approval prior to each meeting. The Engineer shall provide personnel to help facilitate and document meetings and to answer questions as necessary. The Engineer shall develop and submit written summaries of stakeholder meetings including any comments received and responses to comments as well as modifications, if any, to the project resulting from comments received.
 - Up to 15 meetings with agencies, stakeholders, affected property owners and other special interest groups
 - Up to 10 city council and county commission presentations

▶ Technical Work Session

- The Engineer shall conduct and make arrangements for up two (2) Technical Work Sessions (each meeting held in one location) with city and county staff to present project recommendations.
 - The Engineer shall arrange a meeting with the County to review all exhibits and other materials prior to each Technical Work Session.
 - The Engineer shall develop an agenda, presentation, facilitation guide, interactive exercises and a questionnaire to be completed by stakeholders during the Technical Work Session(s) to obtain feedback on the project.
 - The Engineer shall develop and submit written summary of the Technical Work Session(s) that will include comments received, responses to comments, as well as any modifications, if any, to the project resulting from comments received.

▶ Public Outreach

- The Engineer shall conduct and make arrangements for two (2) public meetings (each meeting held in one location). Each public meeting will include in-person and virtual components.
- The Engineer shall:
 - Develop and maintain an email and mailing database for property owners, stakeholders, elected officials, agencies and community organizations.
 - Host a public meeting strategy session with the County prior to public meeting.
 - Coordinate and pay for public meeting venues, equipment rental, security personnel and translators.

- Submit for County review English and Spanish display ads for publication in up to 12 area newspapers for public meeting. Ads must be submitted to the County for review no less than two weeks prior to publication.
 - Conduct postcard mailings for targeted audiences within the study area based on demographic information (i.e., limited internet access, anticipated corridors, Environmental Justice and Limited English Proficiency populations).
 - Mail and email notification (English and Spanish) and a venue map to elected officials within the study area five days prior to advertising public meeting in area newspapers.
 - Mail notification (English and Spanish) and a venue map document to abutting property owners and parcel addresses within a quarter mile of any proposed recommendations.
 - Conduct direct outreach efforts prior to Public Meeting to notify potentially impacted businesses and residential properties in segments of the study area that could have severe impacts and who have not provided significant input.
 - Develop and send up to three (3) email blasts per public meeting to stakeholders and other interested parties for public meeting.
 - Develop and send up to three (3) text notifications per public meeting to interested parties for public meeting.
 - Develop a press release prior to each public meeting.
 - Develop social media posts and editorial calendar for each public meeting. Share social media posts and editorial calendar with city and county staff to promote each public meeting.
 - Coordinate payment and suggest placement of dynamic message signs for each public meeting.
 - Prepare displays and exhibits to be used at open houses for each public meeting.
 - Provide personnel to staff meeting, including personnel to perform registration, document meeting proceedings, provide translation services, make presentations and answer questions. Staffing levels of personnel to be provided identified in Exhibit D. An internal FAQ document shall be developed and provided for staff working at each public meeting.
 - Coordinate a combined open house rehearsal and preparation meeting before each open house. Preparation meeting shall identify potential issues in advance of meeting with the public or stakeholders.
 - Develop a hard copy and online survey for each public meeting to gather input from the public and stakeholders.
 - Develop public meeting summary for each public meeting, including analysis of survey results. Summary shall include a comment response matrix including and responding to up to 10,000 comments or multiple question survey responses. This includes developing up to 60 unique responses to comments. This assumes addressing two rounds of comments/revisions from the County for each public meeting.
 - Analyze and provide executive summary of input received from the public and stakeholders for each public meeting and at the end of the project. This will include GIS analysis to identify where respondents were located and alignment preferences.
 - Develop a virtual public meeting that will provide the same information, materials, exhibits and opportunities to comment as in-person open houses. The virtual public meeting will be linked to the project website and the public will be able to review the information at their convenience during each comment period.
 - Develop and update a project factsheet to provide information about the project, status of the project development process and other pertinent information such as outreach activities and comment opportunities.
- ▶ Media Relations and Issues Management
 - The Engineer shall provide media relations and issues management throughout the project, including development of press releases, interview prep, responses to inquiries and media monitoring.
 - ▶ Project Website
 - The Engineer shall provide four (4) updates to the project website – transition from Phase 1 to Phase 2, during each public meeting, and at the end of the project. Minor updates, such as changes to the list of FAQs or posting

public meeting summaries, shall also be made as the project progresses. The Engineer shall submit updates to the County for review and approval.

- ▶ Project Video
 - The Engineer shall develop two (2) project videos, two minutes or less, for use on the project website, social media platforms and during any public and stakeholder meetings. The videos shall provide a general overview of the project such as area, scope, background, process, timeline and resources.
- ▶ Environmental Review
 - The Engineer shall review all public facing materials to maintain consistency with federal, state and local environmental regulations.
 - The Engineer shall review other study reports, such as Loop 9 and Collin County Outer Loop, and identify useful study best practices. The purpose of this would be to identify innovative funding methods, project prioritization and staging for improvement projects.
 - The Engineer shall identify environmental impacts of significance in alternative alignments to be considered more in-depth in future phases.
 - The Engineer shall develop preliminary need and purpose of the project.

TASK 7: PROJECT RECOMMENDATION PLAN

- ▶ Project Recommendation Plan Report
 - The Engineer shall assemble a report disclosing the study process and recommended improvements to advance in subsequent Thoroughfare Plan updates, design, schematic or environmental projects. The report shall be developed in a format making use of descriptive graphics. The report shall include the memoranda, evaluation matrices, summary tables, and maps completed under the previous tasks.
 - The implementation plan report shall also include the sections as described below:
- ▶ Project Phasing
 - The Engineer shall utilize various planning year horizons traffic data, developed by Collin County/NCTCOG, to develop a program of short-term, mid-term and long-term projects to advance the phased development of the project.
 - The Engineer shall prepare colorized map showing project phasing.
- ▶ Other Studies and Modes of Transportation
 - The Engineer shall perform an analysis of the ability to incorporate other modes of transportation, such as mass transit, bicycle and pedestrian accommodations, and designated alternate truck routes, in future transportation planning or improvements. The analysis shall include coordination with NCTCOG, Collin County Regional Trails Master Plan, and the Collin County Transit Study.
 - The Engineer shall perform an analysis of the ability to connect with community cultural resources and parks.
 - The Engineer shall provide recommendations for future environmental studies.
- ▶ Cost Estimate and Potential Funding
 - The Engineer shall prepare a high-level cost estimate for each of the final build concept alternatives. The cost estimates shall include:
 - Project construction cost estimates current dollar and year of expenditure (based on anticipated let date with inflation) for each proposed short term and mid-term project.
 - Disclosure of availability of potential funding sources for each proposed project.
 - Estimate of proposed ROW costs based on detailed review of County Appraisal District data.
 - Current value analysis based on developer estimates, soft and hard costs on a parcel basis.

DELIVERABLES

- ▶ Project Management Plan
- ▶ Progress Reports and Invoices
- ▶ Project Schedule
- ▶ Quality Assurance/Quality Control Plan
- ▶ Flying Car Maps
- ▶ Updated Collin County Thoroughfare Plan
- ▶ Recommended Improvements Summary Table
- ▶ Planning Roadmap
- ▶ Freeway Alignment Alternatives Layout
- ▶ Arterial Improvements Geometric Layouts
- ▶ MicroStation v8i or Geopak Files
- ▶ Freeway Alignment Alternatives Analysis and Evaluation Matrix
- ▶ Traffic Analysis Technical Memorandum
 - Level of Service (LOS) Maps
 - Traffic Model Files in kmz
- ▶ Technical Work Session Summary
- ▶ Public Meeting Summary
- ▶ Executive Summary
- ▶ Project Video
- ▶ Project Recommendation Plan Report
- ▶ Project Phasing Map
- ▶ Freeway Alignment Alternatives High-Level Cost Estimate