

SCOPE OF WORK FOR THE FM 2920 ACCESS MANAGEMENT STUDY

The scope of services to be provided by the Consultant¹ involves performing an access management and traffic mobility study for the southwest segment of the FM 2920 corridor from Hempstead (southwest of US 290) to Lexington Road (east of I-45). This segment of FM 2920 is approximately 32 miles in length. The purpose of the study is to identify short-term transportation improvements to improve traffic flow and reduce motorist delay.

Sufficient information to measure and evaluate a range of viable short-term improvement concepts will be collected. This consultant team will address cost-benefit and cost-effectiveness of various concepts/solutions. The study shall conclude with the identification of a list of recommended improvements, time frame for implementation, and possible funding sources.

The Consultant, in cooperation with the H-GAC, Cities of Tomball and Waller, Harris County, Houston Northwest Chamber, Tomball Chamber of Commerce and the Texas Department of Transportation, will conduct project and public meetings, and will be required to provide technical assistance for the meetings listed below:

- Steering Committee Meetings (as needed)
- Public Forums (2)
- Stakeholders Meetings/Presentations (minimum of 6)

TASK 0 – PROJECT MANAGEMENT AND COORDINATION

The Consultant's Project Manager, in coordination with the H-GAC's Project Manager, will be responsible for directing and coordinating all activities associated with the FM2920 Corridor Study.

0.1 - Progress Reports and Invoices

The Consultant will review the project schedule and prepare monthly progress reports for review by the H-GAC's Project Manager. Invoices for all work completed during the period will be submitted monthly [with a progress report] for work performed by the Consultant and all Sub consultants. Monthly progress reports will include a summary of:

- A. Activities, ongoing or completed, during the reporting period;
- B. Activities planned for the following month;
- C. Problems encountered and actions to remedy them;
- D. Status, including a tabulation of percent complete by task, management schedule showing study progress, supporting documentation and,
- E. Minutes of meetings.

Deliverables

- ◆ Monthly invoice and progress report [one original with documentation attached.]

¹ In this Scope of Work, Consultant refers to the Team of Consultants with the Prime Consultant serving as the principal contact with H-GAC and the Steering Committee.

(Documentation shall include travel related expense receipts and any equipment purchase receipts. Time sheets and other direct expense receipts shall be maintained at the billing site for contract monitoring/auditing purposes.)

0.2 - Control/Scheduling

At the beginning of the project the Consultant will prepare a graphic schedule indicating tasks, milestones, deliverables, and Steering Committee review requirements.

Deliverables:

- ◆ Schedule. (Copies for Steering Committee and for contract file)

0.3 – Sub-consultant Management and Meetings

The Consultant will prepare subcontracts for Sub-consultant(s), monitor Sub-consultant staff activities and adherence to schedules, and review and recommend approval of Sub-consultant invoices. Also, the Consultant will schedule and participate in meetings throughout the project.

Deliverables:

- ◆ Sub consultant Contracts. (1 original) within 30 days of each execution.

0.4 - Quality Assurance/Quality Control

The Consultant will provide continuous quality assurance and quality control throughout the life of the study. The prime consultant shall provide H-GAC staff periodic opportunities to perform their contract monitoring duties of all consultant team agencies.

TASK 1 – PUBLIC / AGENCY INVOLVEMENT

1.1 – Public Involvement Plan

The Consultant will prepare a public involvement plan to support the study. This plan will identify the responsibilities of the Consultant and the cash and in-kind funding agencies and determine a preliminary public and stakeholder meeting schedule.

1.2 – Study Steering Committee

A Steering Committee will be established by H-GAC to guide the technical development of the study. This committee will have representation from the funding agencies. The Steering Committee will meet as needed to receive and assess reports on progress, provide comments on the schedule, coordinate with their respective agencies, and provide technical oversight of major activities associated with the study. The meetings may be face to face or via conference call. The Steering Committee will consist of staff from the Texas Department of Transportation, the Houston-Galveston Area Council, the Cities of Tomball and Waller, Harris County, Houston Northwest Chamber of Commerce, and Tomball Chamber of Commerce applicable transit providers, applicable private sector associations, and Consultant staff. Additional topics of this group may include:

- Establishment of the study goals, objectives, and evaluation criteria;
- Urban planning issue identification; analysis of corridor findings;
- Development of short-term improvement concepts.
- Feasibility and fundability of any medium or long-range improvement concepts.

1.3 - Public Meetings

The Consultant will plan, coordinate, and execute two (2) public meetings at mutually agreed upon sites to relay the purpose and process (first meeting), and then the progression and recommendations (second meeting) of the study. The Consultant will coordinate with Texas Department of Transportation, the Houston-Galveston Area Council, the Cities of Tomball and Waller, Harris County, Houston Northwest Chamber of Commerce, and Tomball Chamber of Commerce (among other sources) for meeting locations.

The H-GAC will prepare a meeting notice in post card format [or flyers], a letter to notify public officials, and media release announcements for each meeting. The Committee members may be asked to contribute contact information for mailings and assistance in maximum distribution of meeting notices. The H-GAC will be responsible for duplicating the public officials' letters and mailing them, and distributing the media releases. The distribution of Flyers or Post Cards should be achieved by the most cost effective methods using any Steering Committee resources available such as periodic mailings, newsletters, websites, etc.

The Consultant will prepare questionnaires, sign-in sheets, and comment forms for each meeting. Content, production, and duplication of any other meeting handouts will be the responsibility of the Consultant. The Consultant will prepare exhibits as needed for each public meeting. The Consultant will provide personnel to conduct and staff the public meetings. The Consultant may request Steering Committee staff assistance as needed. The Consultant will compile comments received at the meetings, and produce documentation of the comments from each meeting.

1.4 – Mailing List

The Consultant will collect existing mailing lists from immediately available sources. The Consultant may reformat the mailing lists to a uniform format, check for duplicates, and verify elected official information is up-to-date. The Consultant may print multiple sets of mailing labels for each public meeting for use in advertising. Depending on final agreements, mailing lists for FM2920 stakeholders provided by the Cities, Counties, and H-GAC may be handled differently. **However, a compiled list of all names and addresses of persons notified of the public forums must be included in the public forum documentation deliverable.**

1.5 – Stakeholders Meetings

The Consultant will provide support personnel and exhibits for six plus (6+) meetings with Stakeholders. Exhibits for the stakeholder meetings may be the same as

those used for public meetings. The Consultant Project Manager will be responsible for handling the logistics of these meetings.

Deliverables:

- ◆ Questionnaires and comment forms for two (2) public meetings.
- ◆ Attendance sheets for two (2) public meetings.
- ◆ Appropriate exhibits and/or displays for two (2) public meetings.
- ◆ Documentation for two (2) public meetings including: photographs or copies of informational displays, number of people attending, handouts and questionnaires distributed at the meetings, comment cards, and letters received, attendance sheets from each meeting, mailing lists used in mailings, and summary of oral and written input. (2 copies, [1 in electronic form])
- ◆ A brief technical memorandum for each Stakeholder Meeting describing the organization, attendance, questions, and comments about the study.

TASK 2 - ASSEMBLY AND REVIEW OF DATA

2.1 Collection of Data, Reports, and Maps

Once data needs and sources are identified, the Consultant will contact the appropriate agencies and organizations to obtain the data. Some of the data to be collected may include, but are not limited to:

A. Transportation System Data for FM 2920:

1. Detailed existing data from the public entity stakeholders, such as:
 - a. Traffic volumes (daily and peak hour)
 - b. Roadway and intersection geometrics
 - c. Traffic signal timings and/or plans
 - d. Median opening locations
 - e. Access to adjacent land uses
 - f. Adjacent land use (plats, classifications, acreage by type)
 - g. Vehicle occupancy rates
 - h. Travel times (4 runs AM, 4 runs PM)
 - i. Rights-of-way (if available)
 - j. Roadway plans (where applicable)
 - k. Intersection signal box inventory and condition
2. Existing and proposed transit data from applicable transit agencies to include ridership, route information, fares, and travel times.
3. Most current Transportation Plans from TxDOT, METRO, H-GAC, and local governments to include committed improvements and travel forecasts.
4. Most current Transit Service and Facility Planning data from transit agencies, to include any revised Service Plans, if applicable.
5. Pertinent data on existing and planned major utilities and railroad facilities.
6. Most recent digital aerial orthophotography of the study area immediately available from H-GAC or TxDOT or other source as appropriate.
7. Consultant will supplement available data obtained from area agencies with field data collection, such as traffic volume counts at major intersections.
8. Based on “hot spot” locations identified from older H-GAC GIS data, crash

records will be collected from the applicable local government records.

- B. Report Data - Obtain previous corridor studies, reports, and/or plans conducted by other agencies and groups, including the 2002 Westheimer, the 2004 FM 518, and the 2004 FM 1960 Corridor Studies.
- C. Land Use Plans - Obtain mapping showing existing land use, existing building footprints, major utility ROW, and street names. Obtain existing development guidelines and restrictions, development densities, etc., for the study corridor.

2.2 – Study Goals and Objectives

The Consultant in conjunction with the Steering Committee will establish a set of study goals and objectives based on the existing conditions and corridor enhancement needs. Goals shall include long-term and short-term transportation, parking, land use, urban form, linkage, and physical characteristics.

2.3 – Evaluation Categories and Measures of Effectiveness

A set of criteria will be developed to assist in evaluating each improvement concept. The broad categories of transportation efficacy, right-of-way, socio-economic impacts, urban design, emergency evacuation, environmental impacts, and cost effectiveness will be further defined into evaluation criteria. The Steering Committee and public input will be used to establish key issues and evaluation criteria for analysis.

The following items are used only to serve as possible examples of criteria (measures of effectiveness): mobility, capital cost, operating and maintenance cost, benefit-cost ratio or cost effectiveness, social effects, evacuation resource, economic effects, environmental effects, and implementation timeframe.

Two sets of traffic measures of effectiveness will be developed. One set will apply to FM2920 and the other set will apply to cross streets where their impact may be critical. Only FM 2920 will be included in the traffic simulation model developed in Task 4.

TASK 3 - EVALUATION OF EXISTING CORRIDOR

3.1 - Current Corridor Conditions and Influences

The Consultant will identify and quantify influences and concerns based on current conditions. This determination will serve to identify key issues related to transportation service throughout the corridor. The Consultant will identify existing travel demands, crash hot spot locations, level-of-service, roadway conditions, and land use; known constraints and sensitive areas within the study area which might eliminate or otherwise hinder development options; and identify known opportunities conducive to the improvement of development options.

3.2 – Existing Access Management Practices

The Consultant will identify and summarize the existing access management ordinances / rules / practices of the political entities along the FM 2920 corridor with respect to roadway configuration and access. This summary should be compared to the

TxDOT Proposed rules and note any inconsistencies, conflicts, or absences.

3.3 – Identify Access Management Issues and Needs

Using inputs from collected data in Task 2, the public forum, stakeholder meetings, and interviews with the Steering Committee agencies, the Consultant will identify and categorize the needs and issues along the corridor. This chart or list should include all applicable intersections, applicable driveways², and median openings.

Prior to any public meetings, an aerial photo of sufficient scale to view driveways should be annotated with roadway identifications and other pertinent information with respect to roadway configuration and access. This graphic should be used in conjunction with all public meetings to assist the public and stakeholders in describing needs and issues. For the second or post-analysis meeting, this aerial graphic will be annotated with proposed solutions, accompanied by appropriate text.

Deliverables:

- ◆ Graphical map(s) illustrating current corridor influences. (1 table top (or wall) and [number required by Steering Committee] 11 x 17” copies)
- ◆ Exhibits and or displays graphically illustrating current corridor influences. One (1) set³.
- ◆ Examples of each type of ordinance inconsistencies. (Number required by Steering Committee)

TASK 4 - ANALYSIS OF SHORT TERM SOLUTIONS

4.1 – Develop Peak Hour Traffic Operations Model

Consultant will develop a traffic operations model of the FM 2920 using traffic operations software agreed to by the Steering Committee. The simulation model will be developed for the AM and PM peak hour and include all signalized cross streets and major developments/special generators (as determined by the consultant). The Consultant may break up the development of the model networks into logical segments as needed. Traffic volumes, roadway geometry, transit, traffic signal timings, and crash data will be updated to represent existing year 2006 [or 2007] conditions.

While no CMAQ funding is involved in this study, air quality benefits for delay reduction will be calculated by H-GAC staff for future use as a possible State Implementation Plan (SIP) commitment in terms of delay reduction must be calculated. This will require modeling a forecasted year, perhaps one of the years H-GAC already models (2005, 2009, 2019, 2025, **2035**) to minimize input needs. The models will be utilized for more detailed traffic operational analyses at major intersections. This analysis will result in an evaluation of various performance measures, which could include capacity/LOS, vehicle delays, fuel consumption, and air emissions. H-GAC

² Applicable driveways can be defined as those driveways whose configuration or number of entrances might suggest consolidation or reconfiguration.

³ CD copies of final physical exhibits should be provided to Steering Committee at appropriate deliverable points.

modeling inputs, outputs, and applicable networks will be made available to the Consultant.

4.2 - Identify and Define Proposed Improvements

The Consultant will identify and define three ranges of reasonable improvements within the study area that can be implemented within a short-term [1-4 years] timeframe, an intermediate [5-10 years] timeframe, and a long-term [11+ years] timeframe. The principal difference is whether the proposed solution is entirely within the existing right-of-way such as median closures or involves negotiation with adjacent landowners such as adding turn lanes or driveway reconfigurations (access management), cost considerations, and roadway capacity additions or influencing land use changes.

- A. Review prior corridor studies, mobility data, and evaluations related to the study corridor. Consider recommendations from past studies.
- B. The Consultant will prepare an initial list of improvement concepts, potentially including:
 - Intersection Geometric Improvements (turn lanes and grade separations);
 - Median Opening Modifications (closures and consolidations);
 - Access Control Modifications (driveway consolidations and closures);
 - Traffic Signal Modifications (timings, coordination, and emergency preemption);
 - Transit System Modifications (signal preemption, bus stop relocation, exclusive bus lanes, and route modifications or consolidations);
 - Intelligent Transportation System Improvements (driver information systems, changeable message signs, and alternate route notification with real time traffic signal adjustments);
 - Travel Demand Management Programs (carpool/vanpools, telecommuting, parking management, employer trip reduction programs, and transit incentives);
 - Alternative Corridor Improvements (transportation system improvements along alternative parallel corridors which would assist in reducing demand); and,
 - Negative Land Use Impacts
- C. Additional concepts may be identified via the Steering Committee and public input. The Consultant will utilize previous mobility data, evaluations, and corridor studies.
- D. The Consultant will evaluate the identified improvement concepts based on the study goals and objectives developed in Task 2. Improvement concepts that do not suitably address the goals and objectives will be eliminated from further consideration. Eliminated concepts will be documented in the final report.
- E. The Consultant will evaluate critical crash locations and develop techniques to mitigate “hot spot” crash locations.

4.3 - Development of Short/Medium Term Improvement Concepts

The Consultant will review the improvement concepts identified in Task 4.2, taking into account comments from the Steering Committee and public input. The Consultant will prepare line sketches for each concept, showing (if appropriate) typical sections, lane configurations, modal components, and profiles for changes in grade from existing conditions. Each improvement concept will be ranked by its viability and compatibility with other improvement concepts for achieving acceptable traffic operations within the FM 2920 Corridor segment.

The alternatives will be developed to include:

A. Geometric Features

1. Typical diagrams showing modal components for each alternative, including improvements planned or recommended for parallel routes within the corridor.
2. Sketches of typical cross-sections appropriate for each alternative.
3. Roadway geometry compatible with several travel modes.
4. TSM components.

B. Capital Costs

1. Preliminary construction costs of proposed improvements.
2. ITS, TDM and TSM.
3. Right-of-way acquisition.

C. Mobility

Each of the viable improvement concepts identified in Task 4.2 will be evaluated from a mobility standpoint. The improvement concepts will be modeled using the traffic simulation models of the FM 2920 corridor segment developed in Task 4.1. The following items are used only to serve as possible examples of criteria that may be used to evaluate the improvement concepts from a mobility standpoint:

1. Vehicle congestion delay
2. Percent of increased travel time due to congestion
3. Average peak hour travel speed
4. Travel times from selected origins/destinations
5. Peak hour level-of-service (LOS)
6. Accessibility enhancements to activity centers (qualitative)
7. Impacts of alternatives on existing facilities and system effectiveness (qualitative)
8. Consistency with community and regional transportation plans (qualitative)
9. Discussion of future land use / transportation interactions that might influence and enhance the travel characteristics of the corridor in short or medium term.

D. Cost Effectiveness

The Consultant will evaluate cost-effectiveness to determine if the improvements cause sufficient user benefits to justify the investment. The Consultant will evaluate cost-effectiveness by determining the benefits (dollar-value) associated with the reduction in vehicle delay due to a short-term improvement and comparing the benefit to the cost of implementing the improvement. Benefits will be determined using the results of the peak hour model and converting the hourly delay values to estimated daily and annual delays, which will then be multiplied by an average cost per hour of delay to achieve annual benefits (dollar-value).

Deliverables:

- ◆ Charts or tables describing the Short and medium-term recommendations by type and jurisdiction with description, cost estimates, and measurable air quality benefits. (One reproducible set per entity)

TASK 5 – LONG TERM ACCESS MANAGEMENT STRATEGIES

5.1 - Identify Access Management Action Strategies

The Consultant will identify access management policy issues that, if adopted, would enhance the future development of the FM 2920 corridor segment. For each issue identified, the Consultant will provide examples of these access management ordinances, rules, land use applications, or practices currently in use in other jurisdictions, highlighting any found to exist already in Texas.

At the request of the Steering Committee, the Consultant may propose strategies and timing for implementing proposed regulations, ordinances, and land use practices, etc. Such strategies might include example ordinances, adoption procedures, contacts, redevelopment options, etc. These action strategies should be developed for each of the political entities along the FM2920 corridor segment. If the research of this study identifies one or more ‘long-term projects’ not currently part of the adopted Regional Transportation Plan and the Steering Committee elects to include these ‘long-term projects in the RTP, then the consultant will prepare similar tables as for Task 4.2 above.

Deliverables:

- ◆ Charts or tables describing the access management issue, its political entity application, and type of action required (practice, ordinance, law, etc.). (One reproducible set per entity)
- ◆ Examples of each rule, ordinance, practice, law, etc. (One reproducible set per entity)
- ◆ Long-Term Improvements Table [if needed]
- ◆ Discussion of future land use / transportation interactions that might influence and enhance the travel characteristics of the corridor.

TASK 6 – FINAL REPORT

The Consultant will prepare a final report reflecting the recommended improvement concepts and enhancements. The report will provide a description of the study effort associated with identification, definition, development, and refinement of

improvement concepts. The report will also include a discussion of any concepts eliminated for not addressing the study goals and objectives. The methodology and evaluation criteria will be explained. A section, documenting the traffic analysis including the development of the traffic simulation models for the short-term solutions analysis, will be included.

The report should include a summary of recommended projects along with project descriptions, costs, benefits, and potential funding sources for each of the political entities. The list of recommended projects should be prioritized in cooperation with the Steering Committee. The report should also include a summary of recommended long term access management action strategies [and projects, if applicable] for each of the political entities in the corridor.

Deliverables:

- ◆ Base maps showing the location, layout, and typical sections for each concept considered. (One reproducible copy per entity)
- ◆ Final Report⁴, including maps or other drawings and exhibits of each concept recommended. (Ten (10) draft copies, Twenty (20) final copies.
- ◆ Executive summary, (Ten (10) draft copies, Twenty (20) final copies.
- ◆ One duplexed, camera-ready copy and one hundred (100) CD copies of all deliverables)

⁴ Final reports should be consistent with previous access management studies such that they are in color, duplexed, and 11x17 landscape format.