

**CITY OF EL PASO, TEXAS**  
**AGENDA ITEM DEPARTMENT HEAD'S SUMMARY FORM**

**DEPARTMENT:** Engineering Department

**AGENDA DATE:** May 8, 2007

**CONTACT PERSON/PHONE:** Javier Reyes, P.E., Engineering Department, Ext. No. 4630

**DISTRICT(S) AFFECTED:** Citywide

**SUBJECT:**

That the City Manager be authorized to sign an Interlocal Agreement between the City and The University of Texas at El Paso to provide services to develop a geographic information system (GIS) layer for storm water drainage infrastructure assets, a GIS visualization tool for tracking surface runoff within the City, a GIS layer for traffic signals, and a GIS layer for fiber optics conduit systems. The total cost for services rendered under the Agreement shall not exceed ONE HUNDRED AND SIX THOUSAND FIFTEEN AND NO/100 DOLLARS (\$106,015.00).

**BACKGROUND / DISCUSSION:**

The City wishes to enter into a interlocal agreement with the University of Texas at El Paso (UTEP) to provide services to develop a geographic information system (GIS) layer for storm water drainage infrastructure assets, a GIS visualization tool for tracking surface runoff within the City, a GIS layer for traffic signals, and a GIS layer for fiber optics conduit systems. The City is continuing its efforts to enhance information on the existing City owned infrastructure on the GIS network. UTEP will develop a comprehensive GIS layer for the City's storm water infrastructure that includes drainage basins, channels, underground storm sewers, drainage inlets and outlets. This tool will assist City staff to continue the assessment and maintenance of drainage infrastructure. UTEP will develop a tool to show the flow of surface runoff within the City limits and how it relates to the existing storm water drainage system. This tool will allow for better planning of proposed drainage improvements. Also included in UTEP's services is the integration of a GIS layer for traffic signals. The traffic signals GIS layer will further enhance the existing Traffic Management Information System. Another GIS layer that will be developed is for the fiber optics conduits system. Because of the increased use and placement of fiber optics on City roadways it is imperative to manage the placement of fiber optic conduit in a coordinated manner to avoid repetitive street cuts and minimize disruptions to area businesses and residents.

**PRIOR COUNCIL ACTION:**

Previously City Council has not considered this item.

**AMOUNT AND SOURCE OF FUNDING:**

Funding Source	Storm 2006
Project No.	PSTM06FC004A & PSTM06FC004B & PSTM06FC004C & PSTM06FC004D
Department ID	14200500
Fund No.	27264
Account No.	508016

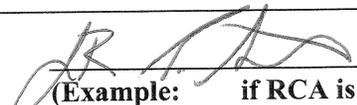
**BOARD / COMMISSION ACTION:**

N/A

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\*\*\*\*\*REQUIRED AUTHORIZATION\*\*\*\*\*

**LEGAL:** (if required) \_\_\_\_\_ **FINANCE:** (if required) \_\_\_\_\_

**DEPARTMENT HEAD:**  \_\_\_\_\_  
(Example: if RCA is initiated by Purchasing, client department should sign also)

*Information copy to appropriate Deputy City Manager*

**APPROVED FOR AGENDA:**

**CITY MANAGER:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

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**RESOLUTION**

**BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EL PASO:**

That the City Manager be authorized to sign an Interlocal Agreement between the City and The University of Texas at El Paso to provide services to develop a geographic information system (GIS) layer for storm water drainage infrastructure assets, a GIS visualization tool for tracking surface runoff within the City, a GIS layer for traffic signals, and a GIS layer for fiber optics conduit systems. The total cost for services rendered under the Agreement shall not exceed ONE HUNDRED AND SIX THOUSAND FIFTEEN AND NO/100 DOLLARS (\$106,015.00).

**ADOPTED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2007.**

THE CITY OF EL PASO

\_\_\_\_\_  
John F. Cook  
Mayor

ATTEST:

\_\_\_\_\_  
Richarda Duffy Momsen  
City Clerk

APPROVED AS TO FORM:

\_\_\_\_\_  
Lupe Cuellar  
Assistant City Attorney

APPROVED AS TO CONTENT:

  
\_\_\_\_\_  
R. Alan Shubert, P.E., C.B.O.  
City Engineer

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STATE OF TEXAS            )  
  )  
COUNTY OF EL PASO    )       **INTERLOCAL AGREEMENT**

This Agreement entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2007, by and between the City of El Paso, a municipal corporation situated in El Paso County, Texas, hereinafter referred to as "CITY", and The University of Texas at El Paso, a Texas Institution of Higher Education, hereinafter referred to as "UTEP", pursuant to the Interlocal Cooperation Act, Art. 791.001, et seq., Texas Government Code.

**WITNESSETH**

The CITY and UTEP for the consideration and mutual promises as herein set forth agree as follows:

1.       SCOPE OF SERVICES

UTEP agrees to provide services to develop a geographic information system (GIS) layer for storm water drainage infrastructure assets, a GIS visualization tool for tracking surface within the City, a GIS layer for traffic signals, and a GIS layer for fiber optics conduit systems, as more specifically stated in the scope of services as set forth in Attachment "A", made a part hereof by this reference for all purposes.

2.       TERM

The term of this Agreement shall begin May 15, 2007 and shall end November 15, 2008. The term of this agreement may be extended upon the written approval of both parties. The City Manager may exercise the option to extend the term on behalf of the City provided that no additional compensation is required.

3.       COMPENSATION AND METHOD OF PAYMENT

The total cost of the contract shall not exceed ONE HUNDRED AND SIX THOUSAND FIFTEEN AND NO/100 DOLLARS (\$ 106,015.00). UTEP agrees that at no time shall it make a claim against the City for more than the rate provided under the terms of this Agreement. Payment for each Phase shall be made on a monthly basis. The Owner shall make payments upon presentation of UTEP's detailed Invoice and accompanying Summary and Progress Report and the Owner's written approval.

4.       CERTIFICATION

The CITY hereby certifies that the services to be provided by UTEP are necessary and essential activities that are properly within the statutory functions and programs of the respective state and local entities.

5.       APPLICABLE LAWS

UTEP shall perform all services under this Agreement in accordance with all applicable local, state, and federal laws and regulations.

6.       INDEPENDENT CONTRACTOR

Nothing contained herein shall be construed as creating the relationship of employer and employee between the CITY and UTEP.

7. ASSIGNMENT

The services to be provided under this Agreement are specific to UTEP and shall not be assigned or delegated without the prior written consent of the CITY.

8. TERMINATION

A. Either party may terminate this Agreement if the other is in default upon five (5) days written notice to the other party provided that the other party shall be given a reasonable time to cure said default. The CITY or UTEP may terminate this Agreement for any cause upon thirty (30) days written notice to the other party.

B. Termination shall be without prejudice to any obligation by one party to the other, which shall have accrued and be owing prior thereto.

C. Upon termination, UTEP shall return any materials belonging to the CITY, such as all drawings, plans, records, and other materials, which are currently in UTEP's possession.

D. The City Manager has the authority to exercise the termination provisions of this Agreement on behalf of the City.

9. NOTICES

All notices, communications and reports under this Agreement shall be hand-delivered or mailed, certified, return receipt requested, to the respective parties at the respective addresses shown below, unless and until either party is otherwise notified in writing by the other party:

CITY: City Engineer  
2 Civic Center Plaza  
El Paso, Texas 79901

UTEP: Nasir Gharaibeh, Ph.D., P.E.  
Assistant Professor  
Department of Civil Engineering  
University of Texas at El Paso  
500 W. University  
El Paso, Texas 79968

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10. WAIVER

Action or inaction by either party regarding any default, breach or condition precedent shall not be construed as a waiver of any other default, breach or condition precedent or any other right hereunder.

11. DISCRIMINATION

A. Discrimination Prohibited: No person in the United States shall, on the grounds of race, creed, color, national origin, sex, age, or handicap, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under, any programs or activity funded in whole or in part with funds made available to UTEP pursuant to the terms of this Agreement, or any written amendment hereto.

B. Specific Discriminatory Actions prohibited: UTEP may not utilize criteria or methods of administration which have the effect of subjecting individuals to discrimination on the basis of race, creed, color, sex national origin, age or disability, or having the effect of defeating or substantially impairing accomplishment of the objectives of the programs funded

pursuant to this Agreement or any written amendment hereto with respect to individuals of a particular race, color, national origin, creed, sex, age or disability.

12. NO VERBAL AGREEMENT

This Agreement contains all commitments and agreements of the parties hereto, and no verbal or other written commitment shall have any force or effect if not contained herein.

13. VENUE

The parties hereto agree that this Agreement shall be enforceable in El Paso, Texas, and if legal action is necessary to enforce it, exclusive venue shall lie in El Paso County, Texas.

14. CONTRACT INTERPRETATION

In interpreting the various provisions of this Agreement in a court of law, any court having jurisdiction shall apply the laws of the State of Texas to interpret the terms and provisions in this Agreement.

15. SEVERABILITY

If any provision of this Agreement is found by a court of competent jurisdiction to be illegal, invalid, or unenforceable, the remainder of this Agreement will not be affected and in lieu of each provision which is found to be illegal, invalid or unenforceable, there will be added as part of this Agreement a provision which preserves the intention of the unenforceable provision, but which complies with the law.

16. CAPTIONS

The captions to the various paragraphs of this Agreement are for informational purposes only and shall not alter the substance of the terms and conditions of this Agreement.

17. BINDING AGREEMENT. The individual signing this agreement acknowledges that he is authorized to do so and said individual further warrants that he is authorized to commit and bind UTEP to the terms and conditions of this agreement.

**IN WITNESS WHEREOF**, the parties have executed this Agreement in the City of El Paso to be effective on the date and year first above written.

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**THE CITY OF EL PASO**

\_\_\_\_\_  
Joyce A. Wilson  
City Manager

**UNIVERSITY OF TEXAS AT EL PASO**

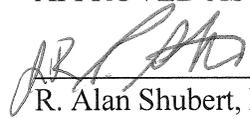
\_\_\_\_\_  
Print Name: \_\_\_\_\_  
Title \_\_\_\_\_

APPROVED AS TO FORM:



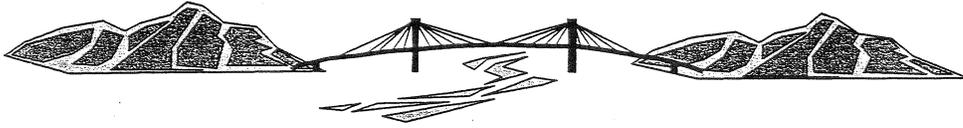
Lupe Cuellar  
Assistant City Attorney

APPROVED AS TO CONTENT:



R. Alan Shubert, P.E., C.B.O.  
City Engineer

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***Enhancements to El Paso's GIS-based Infrastructure Management Systems  
Proposal to the City of El Paso***

Submitted to:  
The City of El Paso

Prepared by:  
Nasir Gharaibeh, Ph.D., P.E.  
Assistant Professor  
Department of Civil Engineering  
University of Texas at El Paso

October 31, 2006

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### Background

As shown in Table 1, the City of El Paso manages a large network of street and storm water drainage infrastructure assets.

Table 1. El Paso's Major Street and Storm Water Drainage Infrastructure Assets  
(source: City budget, 2005 & 2006).

Infrastructure Asset	Quantity/Size
Paved Roads, miles	1,922
Street Resurface/Rehab, square yards	916,974
Signaled Intersections Maintained, number	574
Storm Water Conduit, miles	808
Storm Water Ditches, number	132
Storm Water Inlets, number	2,830
Storm Water Ponding Basins, number	267
Major Earthen Ditches, number	41
Major Concrete Lined Channels, miles	70
City & Corps of Engineers' Dams, number	14

The recent 2006 flood has shown that there is a need for comprehensive and current data on these infrastructure assets (e.g., location, condition, capacity etc.) to aid in their inspection and maintenance.

The City has already developed a Geographic Information System (GIS) that contains inventory, location, condition, and other data on many of these infrastructure assets. Also, the City utilizes the Cityworks® GIS-based Asset Maintenance Management System to track and manage maintenance activities associated with assets and/or addresses, such as work orders. However, information gaps still exist in these systems.

A series of meetings were held between UTEP's Civil Engineering faculty and the City's personnel to discuss how UTEP can assist in filling these information gaps and in enhancing the City's infrastructure management information systems.

### **Objectives**

The primary objective of this project is to enhance the City's infrastructure management information systems. This entails gathering new and verifying existing data on the City's storm water drainage and roadway infrastructure assets, and integrating these data with the City's existing GIS.

### **Project Tasks**

We propose accomplishing the objectives of this project according to the following four tasks.

#### Task 1. Develop a GIS Layer for Storm Water Drainage Infrastructure Assets

This task consists of developing a comprehensive GIS layer (both map and attribute data) for the City's storm water drainage infrastructure assets. These assets include reinforced concrete pipes (RCP), box culverts, pump stations, inlets, storm manholes, junction boxes, built channels, natural channels, and ponds. This layer will be integrated with the City's existing GIS.

We propose completing this task using the following steps:

- Step 1. Review existing hard records to extract needed data such as location, type, size, design, water elevation, etc.
- Step 2. Perform a global positioning system (GPS) field survey to verify the data obtained from hard records and note any discrepancies.
- Step 3. Scan hard records (e.g., improvement plans and final design records) and integrate the scanned images with the GIS layer
- Step 4. Integrate the developed GIS layer with the City's existing GIS.

#### Task 2. Develop a GIS Visualization Tool for Tracking Surface Runoff within the City

A GIS-based visualization tool will be developed to show the flow of surface runoff within the City's limits and how it relates to the City's storm water drainage system. For example, the surface runoff from the Franklin Mountains and the New Mexico/Texas State line flows into the Northeast Pond (a large retention basin) and other smaller ponding areas. Such a visualization tool will help show the spatial relationship between the path of this flow and the flood control system in the Northeast part of El Paso (which consists of several channels, dams, retention basins, culvert structures and a levee and was built primarily by the Corps of Engineers in the late 1970's and early 1980's).

We propose completing this task using the following steps:

- Step 1. Design the visualization model.
- Step 2. Develop hydrological models for tracking surface runoff.
- Step 3. Implement the hydrological and visualization models in GIS.



### Team and Budget

The proposed tasks will be performed by UTEP faculty and students, with guidance from City personnel. Dr. Nasir Gharaibeh, PE will serve as the Principal Investigator (PI) for this project and will be assisted by three UTEP graduate students. He will oversee the entire work effort and manage the project budget, schedule, and quality.

Dr. Gharaibeh is an Assistant Professor of Civil Engineering at UTEP. He has more than 10 years of experience in conducting consulting and applied research that deals with development and implementation of GIS-based infrastructure management systems. Dr. Gharaibeh joined UTEP after serving for seven years as a Senior Engineer with Applied Research Associates, Inc. (a major engineering consulting company with several offices in North America). The biographical sketch of Dr. Gharaibeh is provided in Appendix A.

The total budget estimated for completing the proposed tasks is \$106,015. This budget will cover research assistantships for three graduate students throughout the project period, two-month salary for Dr. Gharaibeh, and project operational costs. A detailed itemized budget is provided on the following page of this proposal.

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THE UNIVERSITY OF TEXAS AT EL PASO  
ESTIMATED COSTS

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PRINCIPAL INVESTIGATOR: Nasir Garaibeh, , P.E., Ph.D.  
 CO-PRINCIPAL INVESTIGATOR:  
 PERIOD: 1/1/07-6/30/08  
 TITLE: Enhancements to El Paso's GIS-based Infrastructure Mangement Systems  
 AGENCY: City of El Paso

	Year 1	Year 2	Total
<b>A. SALARIES AND WAGES - SENIOR PERSONNEL</b>			
1. N. Garaibeh 2 summer mos. @ 100%	\$10,832	\$3,719	14,551
2. 0.00	0	0	0
3. 0.00	0	0	0
4. 0.00	0	0	0
5. 0.00	0	0	0
6. 0.00	0	0	0
<b>SUBTOTAL</b>	<b>10,832</b>	<b>3,719</b>	<b>14,551</b>
<b>B. OTHER PERSONNEL</b>			
1. POST DOCTORAL ASSOCIATES	0	0	0
2. OTHER PROFESSIONALS	0	0	0
3. GRADUATE STUDENTS 3 students-9 mos. @ 50% (\$25,300 base); 2 students @ 50% (yr	37,950	26,059	64,009
4. UNDERGRADUATE STUDENTS	0	0	0
5. SECRETARIAL/CLERICAL	0	0	0
6. OTHER	0	0	0
<b>TOTAL - SALARIES AND WAGES</b>	<b>48,782</b>	<b>29,778</b>	<b>78,560</b>
<b>C. FRINGE BENEFITS- Faculty/Staff</b>	2,594	883	3,477
<b>FRINGE BENEFITS- Students</b>	7,100	4,740	11,840
<b>TOTAL - FRINGE BENEFITS</b>	<b>9,694</b>	<b>5,623</b>	<b>15,317</b>
<b>D. TOTAL - SALARIES AND WAGES/FRINGE BENEFITS</b>	<b>58,476</b>	<b>35,401</b>	<b>93,877</b>
<b>E. EQUIPMENT</b>			
0.00	0	0	0
0.00	0	0	0
0.00	0	0	0
0.00	0	0	0
0.00	0	0	0
<b>TOTAL EQUIPMENT</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>F. TRAVEL 1. DOMESTIC</b>	0	0	0
<b>2. FOREIGN</b>	0	0	0
<b>TOTAL TRAVEL COSTS</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>G. PARTICIPANT SUPPORT COSTS</b>			
1. STIPENDS	0	0	0
2. TRAVEL	0	0	0
3. SUBSISTENCE	0	0	0
4. TUITION AND FEES	0	0	0
<b>TOTAL PARTICIPANT COSTS</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>H. OTHER DIRECT COSTS</b>			
1. MATERIALS AND SUPPLIES	500	500	1,000
2. PUBLICATION COSTS	0	0	0
3. CONSULTANTS	0	0	0
4. COMPUTER SERVICES	0	0	0
5. SUBCONTRACTS	0	0	0
6 OTHER COSTS (Data Collection Costs)	1,000	500	1,500
<b>TOTAL OTHER DIRECT COSTS</b>	<b>1,500</b>	<b>1,000</b>	<b>2,500</b>
<b>I. TOTAL DIRECT COSTS</b>	<b>59,976</b>	<b>36,401</b>	<b>96,377</b>
<b>J. INDIRECT COSTS - 10% Modified Total Direct Costs</b>			
(Rate Agreement: DHHS; September 21, 2002; Predetermined)	5,998	3,640	9,638
<b>K. TOTAL ESTIMATED COSTS</b>	<b>65,974</b>	<b>40,041</b>	<b>\$106,015</b>

All personnel transactions required to fulfill the provisions of this proposal will be made in accord with, and will be governed by, the appropriate University Personnel Policies and Regulations. All salary increases will conform to University policies, subject to the availability of funds. No officer, member, or employee of the University and no other public officials for the governing body of the locality or localities in which the project is situated or being carried out who exercise any functions or responsibilities in the review or approval of the undertaking or carrying out of this project, shall participate in any decision relating to this project which affects his personal interest or have any personal or pecuniary interest, direct or indirect, in this project or the proceeds thereof.

**APPENDIX A**  
**NASIR G. GHARAIBEH, Ph.D., P.E.**

University of Texas at El Paso  
Phone: (915) 747-5765, Fax: (915) 747-8037, Email: ngharaibeh@utep.edu

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**EDUCATION AND REGISTRATION**

University of Illinois at Urbana-Champaign	Civil Engineering	Ph.D., October 1997
Jordan University of Science and Technology	Civil Engineering	M.S., August 1991
Jordan University of Science and Technology	Civil Engineering	B.S., January 1990

**Professional Engineer, Ohio**

**APPOINTMENTS**

January 2004 – Present	Assistant Professor, Civil Engineering, University of Texas at El Paso
June 1997 – January 2004	Senior Engineer, Applied Research Associates, Inc. (formerly ERES Consultants), Illinois
January 1994 – June 1997	Research Assistant, University of Illinois at Urbana-Champaign
Nov. 1992 – Dec. 1993	Highway Construction Engineer, Nishikawa Gumi Corporation, Japan

**SAMPLE REFEREED PAPERS**

Gharaibeh, N.G., Y-C. Chiu, and P.L. Gurian. "A Decision Methodology for Allocating Funds across Transportation Infrastructure Assets," *Journal of Infrastructure Systems*, ASCE, Volume 12, Issue 1, March 2006, pp. 1-9.

Gharaibeh, N.G., J. Machado, and S. R. Cook "Assessment of the Impact of Inadequate Infrastructures and Housing on the Economic Conditions of Colonias Residents along the U.S.-Mexico Border," *Journal of Infrastructure Systems*, ASCE, 2006 (in review).

Gharaibeh, N.G. and J.D. Walter. "Evaluation of Data Collection and Processing Techniques for Transportation Asset Management." Conference Proceedings, *Second Gulf Conference on Roads*, Abu Dhabi, United Arab Emirates, 2004.

Gharaibeh, N.G. and M.I. Darter. "Probabilistic Analysis of Highway Pavement Life for Illinois," *Transportation Research Record, Journal of the Transportation Research Board*, No. 1823, 2003, pp. 111-120.

Bham, G.H., M.I. Darter, and N.G. Gharaibeh. "Consequences of Utilizing Alternative Pavement Ratings for Prioritizing Pavement Rehabilitation of Illinois Interstate Highway Network," Conference Proceedings, *Application of Advanced Technologies in Transportation*, ASCE, ISBN/SKU 07844406324, 2002, pp. 537-544

Gharaibeh, N.G., M.I. Darter, and D.R. Uzarski, "Development of a Prototype Highway Asset Management System," *Journal of Infrastructure Systems*, ASCE, Vol. 5, No. 2, June 1999, pp. 61-68.

Gharaibeh, N.G., C. Wilson, M.I. Darter, and G. Jones. "Development of a Bike Path Management System for the University of Illinois at Urbana-Champaign," *Transportation Research Record* No 1636, 1998, pp 56-63.

Gharaibeh, N.G., F. LaTorre, M.I. Darter, and D.L. Lippert. "Use of PMS Data for Pavement Engineering Application," *Transportation Research Record* No. 1592, 1997, pp 35-45.

Gharaibeh, N.G., J.E. Hicks, and J.P. Hall. "Statistical and Spatial Analyses of Accidents, Traffic, and Pavement Conditions," ASCE Conference Proceedings, *Traffic Congestion and Traffic Safety in the 21st Century: Challenges, Innovation, and Opportunities*, Chicago, 1997, pp 396-402.

### **SAMPLE PUBLISHED TECHNICAL REPORTS AND UNREFEREED PAPERS**

Machado, J., N.G. Gharaibeh, and J. Gomez, "Development of a Prototype Construction Information System for El Paso," Quad Section-ASCE Fall 2005 Conference, El Paso, Texas, 2005.

Bham, G.H., N.G. Gharaibeh, and M.I. Darter, *GIS-ILLINET Version 2.0 Pavement Management and Information System-User's Guide*, Illinois Cooperative Highway Research Program, FHWA-IL-UI-286, 2003.

Gharaibeh, N.G. and M.I. Darter, *Longevity of Highway Pavements in Illinois-2000 Update*, Illinois Cooperative Highway Research Program, FHWA-IL-UI-283, 2002.

Hoerner, T.E., M. I. Darter, N. G. Gharaibeh, and T. L. Crow. *Comparative Performance and Cost of In-Service Highway Pavements—I-15, Utah*, Portland Cement Association, PCA R&D Serial No. 2209a, 2001

Gharaibeh, N.G., and T. L. Crow. *Comparative Performance and Costs of In-Service Highway Pavements I-40, Tennessee*, Portland Cement Association, PCA R&D Serial No. 2209, 2000.

### **SAMPLE RESEARCH AND DEVELOPMENT PROJECTS**

Co-PI on the Department of Housing and Urban Development (HUD) project "A Partnership for Advancing Technology in Colonia Housing: Access to Technology, Capital, and Knowledge," (2004-2007)

Principal Investigator on the Texas DOT project "Review of TxDOT's Pavement Forensic Studies," (2006)

PI on University Research Institute (URI) project "Development of a Prototype Construction Information System for El Paso," (2005)

PI on the Illinois State Toll Highway Authority (ISTHA) project "*Development of a Roadway Infrastructure Management System GIS Visual Model*" (2003-2004).

Project Manager on the Illinois DOT project "*Enhancement to Illinois Pavement Management System (PMS)*" (1998-2003).