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PROFESSIONAL EXPERIENCE

City of Tampa

411 N. Franklin St. FL 7, O85D2, Tampa, FL 33602 USA

July 2007-May 2014 (Retired): Manager, Enterprise Applications Integration. Report directly to the City of Tampa CIO. Responsible for managing GIS, Web Services, Database Administration and Enterprise Content Management technical teams within the Department of Technology and Innovation. Also responsible for interaction with clients from other City of Tampa offices, departments and divisions, as well as GIS liaison with local county and municipal counterparts, state agencies and local utility companies for LUCA (2010 U.S. Census), data sharing and other functions. Managed creation of ITIL Service Catalog and Service Level Agreements. Participation in ITIL V3 implementation, Riverwalk Project, Enterprise Content Management, other programs. Managed two phases of IT staff consolidation resulting in net annual savings of \$2 million. Managed team winning 2007 Best of the Web award for cities over 250,000 in population. Program Manager for city-wide Novell-to-Microsoft conversion project and 2012 Republican National Convention situational awareness dashboard.

Michael Baker Jr., Incorporated

3601 Eisenhower Avenue, Suite 449, Alexandria, VA 22304 USA

December 2003-July 2007: Director of Business Development Geospatial Information Technology. Responsible for business development and marketing. Capture Manager for multiple programs, including Census 2010 projects, EAGLE and Alliant. Captured primary subcontractor position on Census Bureau GSS procurement (estimated value to Baker: \$42 million). Captured subcontractor position on Census Bureau FDCA procurement (estimated value to Baker: \$28 million). Captured subcontractor position on EPA Geospatial Blueprint Update project. Captured subcontractor position on SDSFIE (estimated value to Baker: \$4 million). Negotiated sub-contractor positions for Alliant (Raytheon) and EAGLE (Lockheed-Martin). Responsible for GIS consulting for selected clients, including AT&T, Southern Company, Verizon Business, EPA and SDSFIE. Security Clearance: Secret.

Austin Communications Education Services, Incorporated

2937 Landmark Way, Palm Harbor, FL 34684 USA

July 1991-November 2003: President and Principal Consultant. Responsible for GIS training, consulting, system design, marketing, product development, technology transfer, bid and proposal development, corporate management and contract employment. Clients included:

Alltel	ComPlus	ITC Service Group
Andersen Kuala Lumpur	CSC Intellicom	Lambda Tech (co-founder)
Andrew Corporation	Edmonton Telephones	LCTX
Antigua Telephones (APUA)	Enghouse Systems	MCI Communications
AT&T	Generation 5 Technology	Mercator Corporation
Barbados Telephone	Geonex	Nevada Bell
Baker Engineering	GeoVision	Pacific Bell
C3	Greenhorne & O'Mara	Price Technical Services
Cadtel Systems	GST Telecommunications	SaskTel
Clarity International	GTE	SNET
Coastal Utilities	Incatel AS	Southern Company

Qwest Communications
Sprint (United)

Telebras CPqD
Tensing-SKS BV

TIME Telekom
US Telephone Association

Management Contracts

In several cases, my technical and professional consulting work evolved into direct, term-employment management contracts:

Greenhorne & O'Mara (St. Petersburg, FL) – May 2002-June 2003. Department Head GIS. Responsible for department management, project management, marketing communications and client liaison. Security Clearance: Secret.

KNT Network Technologies (Duluth, GA) – *November 2000-July 2001*. Senior Director Business and Program Development. Responsible for technology assessment, strategic planning, market development and development of OSS product offerings

ComPlus (Nashville, TN) - *July 1997-February 1999*: Vice President, Corporate Development. Responsible for technology assessment, strategic planning, training, program development, consulting, system design, marketing, product development and corporate management. Senior member of team that increased annual revenue from \$16 million to \$43 million in 16 months.

Mercator Corporation (Hato Rey, PR) - *August 1996-December 1996*: President. Responsible for corporate management, training, marketing and consulting with the Government of Puerto Rico (Centro de Recaudación de Ingresos Municipales) and World Bank (Paraguay Division); (estimated value to Mercator \$23 million).

Andrew Corporation (Orland Park, IL and Moscow, Russia) - *January 1993-September 1994*: Director, Applications Engineering. Responsible for information systems design and development for several Russian-American joint telecommunications ventures. Systems designed and/or specified for purchase included office automation, international electronic mail, automated mapping/facilities management and multi-currency accounting. Also responsible for network product sales, new project bid preparation and on-going information systems support.

Expert Witness Testimony

Barker, Wilson Reynolds & Burke

PNG Telecommunications, Inc. d/b/a PowerNet Global Communications v. S&S Communications, U.S. District Court for the Southern District of Ohio (Western Division), Civil Action No. C-1-01-902.

King & Spalding LLP

Thoroughbred Technology and Telecommunications, Inc. v. Williams Communications, LLC, U.S. District Court for the Northern District of Georgia (Atlanta Division), Case Number 01-CV-1949-RLV.

Baystar Service Corporation/CDI Corporation

311 Park Place Boulevard, Suite 650, Clearwater, FL 34619 USA [CDI acquired Baystar in 1989.]

July 1989-July 1991: Vice President, Automated Mapping and Facilities Management Systems. Responsible for all aspects of corporate GIS activity. Clients included Advanced Computer Graphics, Ameritech Services, C3, CFW Telephone, Coastal Utilities, GeoTechnology International, GTE Data Services, GTE Florida, GTE Network Operations Planning, Lufkin-Conroe Telephone Exchange, MCI, MSE Corporation, New England Telephone and Southwestern Bell

Telephone.

September 1987-June 1989: Director, Automated Mapping and Facilities Management Systems. Responsible for digital cartography marketing, system designs, consultation and project management. Clients included AT&T-EDDS, GTE-Florida and MCI.

September 1985-September 1987: Computer Data Systems Consultant and Regional Manager, MCI. Responsible for hiring, salary assessment, and supervision of approximately 70 contract staff. As a consultant to MCI, responsible for defining, designing, and implementing a hardware, software, and data conversion system for automated mapping and facilities management; preparing standards and technical manuals for fiber optic outside plant engineering and construction.

Chicago Aerial Survey, Incorporated

2140 Wolf Rd., Des Plaines, IL 60018-1932 USA

June 1984-August 1985: Senior Staff Scientist. Project Manager for digital map conversion project for Southern Bell Telephone Company (PLRMS); managed several raster system projects including J.D. Irving and California Department of Conservation; prepared production reports, technical reports, proposals, and in-house training materials for digital cartography.

Geocator, Incorporated

412 1/2 W. Walnut, Columbia, MO 65201 USA

February 1978-May 1984: President. Industrial site analysis for state and local governments and private sector firms; developed site analysis and mapping applications on mainframes and microcomputers.

Other Communications Industry-Related Experience

Summers, 1969-1974: Telephone and CATV craft work, contracted by Harris-McBurney, Rollins Commserve, Ann Arbor Cable and Saginaw Cable. Work included aerial cable placement (Journeyman-B, buried cable placement, crew chief and installation).

ACADEMIC EXPERIENCE

University of Tampa

College of Business, Tampa, FL 33602

2008-2009: Adjunct Professor

Courses taught: Managing Value Through Information Systems & Technology (ITM 607)

Virginia Polytechnic Institute & State University

Urban Affairs and Planning Program, Alexandria, VA 22314

January 2007-May 2007: Adjunct Professor

Courses taught: Introduction to GIS (UAP 5114)

University of Phoenix-Tampa Campus

College of Information Science and Technology, Temple Terrace, FL 33637

March 2002-November 2004: Faculty

Courses taught: Network and Telecommunications Concepts I and II (NTC 360/NTC 410), Technology Transfer in The Global Economy (TMGT 550), Networks/Data Communications I and II (TCM 537/TCM 538)

Florida Metropolitan University

Computer Information Systems Department, Clearwater, FL 33759

November 2002-2004: Advisory Committee Member

University of Missouri-Columbia,

Department of Geography, Stewart Hall, Columbia, MO 65211 USA

September 1977-August 1984: Assistant Professor [On leave: 1980-81]

September 1978-August 1980: Chairman of Department

Courses taught: Location Theory, Cartography, Quantitative Methods, Population Geography, Planning, Southeast Asia, World Regional Geography. Other duties included Faculty Council, 1982-1984 (Chair, Student Affairs Committee 1983-84); various university committees; co-sponsor, Geographic Resources Center (a remote sensing and mapping research facility)

Oxford Polytechnic

Dept. of Social Sciences, Headington, Oxford, OX1 0BP United Kingdom

September 1980-May 1981: Senior Fulbright Fellow (Exchange Professor / Visiting Lecturer)

Courses Taught: Human Geography, Southeast Asia, Political Geography

Guest Lectures

Lawrence Technological University, 1992; Loughborough University of Technology, 1981; University of Oxford, 1981 (Visiting Senior Fellow); Center for International Briefing, 1980, 1981; University of Washington, 1978; Institute for Southeast Asian Studies, 1976

EDUCATION

Ph.D., 1977, University of Michigan, Ann Arbor, MI (Geography)

M.A., 1974, University of Michigan, Ann Arbor, MI (Geography)

B.A., 1972, University of Michigan, Ann Arbor, MI (Geography/Southeast Asian Studies)

Diploma, 1968, Southfield High School, Southfield, MI

CERTIFICATION

GIS Certification Institute – Certified GIS Professional (GISP) Number 46642, 2004-2008, extended 2008-2009; renewed 2009-2014; renewed 2014-2019

TECHNICAL TRAINING

Tampa Police Department Citizen's Police Academy, 2012

IS-700 National Incident Management System (NIMS), An Introduction, 2007

Introduction to ESRI ArcMap, 2007

Miller-Heiman Blue & Gold Training, 2004

Project Management Bootcamps I & II (PSMJ Resources), 2003

Microsoft Project '98 (New Horizons), 1999

Enghouse Systems Geonet Training, 1995

Andrew Corporation Mid-Range Products and Network Products Training, 1994

SUN Microsystems Seminar Series, 1990

DEWS AMS/GIS Operator Training, GeoVision, 1990

Utilities Facilities Management (FRAMME-SM), Intergraph, 1987

Basic Transmission Concepts, Austin Communications Education Services, 1987

Numerical Analysis of Remote Sensing Data, Purdue University, Laboratory for Applications of Remote Sensing (LARS), 1982

Short Course on Demography, National Science Foundation, 1977
Workshop in Photography, National Geographic Society, 1973
Post-graduate courses in mathematics and computer science, University of Missouri, 1977-84

INTERNATIONAL WORK EXPERIENCE

2001 China (business development)
1999 Mexico, Norway (business development)
1996 Malaysia, Thailand, Puerto Rico (consulting, project management, training)
1995 Malaysia, Antigua (consulting, project management, lecturing and training)
1994 Russia, Finland, United Kingdom, Ukraine, Colombia, Thailand (project management, consulting, lecturing and training)
1993 Barbados, Russia (consulting, lecturing and training)
1992 Australia, Brazil, Canada, New Zealand (consulting, lecturing and training)
1991 Australia, United Kingdom, Canada, Barbados (consulting, lecturing and training)
1980-81 United Kingdom, Netherlands (college lecturing)
1975-76 United Kingdom, Singapore, Malaysia, Brunei, Thailand (Ph.D. research)

LANGUAGE SKILLS

Thai – formal training, field practice, moderate oral and written skills
Malay/Indonesian – formal training, field practice, basic oral and written skills
Latin – formal training, basic written skills

PERSONAL COMPUTING SKILLS

Proficient in the use of office automation software (Word, Excel, Lotus 1-2-3, Access, dBase II, dBase IV, Project, Outlook, WordStar, WordStar 2000, VisiCalc, SuperCalc, Frontpage)
Proficient in use of presentation graphics software (PowerPoint, LViewPro, CorelDraw, PageMaker, Adobe, Picasa)
Proficient in database design for geographic information systems (multiple platforms)
Management and design knowledge of geographic information systems (Intergraph (IGDS/DMRS, FRAMME), ESRI (ArcMap), Enghouse (CableCad, Geonet), AutoDesk (Vision, REGIS, AutoCAD), Cadtel, Incatel)
Experienced in use of multiple development tools (Visual Basic, PowerBuilder, FORTRAN, SAS, Bricklin Demo)
Experienced in use of multiple operating systems (JCL, VMS, CMS, DOS (several), Windows (9x, NT, CE, XP, Vista), Mac OS)
Author of *Pangaea* (a business travel support program)
Design and test experience detailed in *Consulting Project Experience* section below

PROFESSIONAL ASSOCIATIONS

Association of American Geographers
Member, 1975-date; Chair, Southeast Asia Division, Asian Specialty Group, 1984-86
Geospatial Information & Technology Association (formerly AM/FM International)
Member, 1984-date; Publications Committee, 1986-87; Standards Committee, 1986-87; Conference Committee (Seminars), Conference XI, 1988; Education Chair, 1989; Conference Principal

and Co-Chair, Conference XIII, 1990; Committee for Asia and the Pacific, Chair 1990-92; Annual Conference Chair, Conference XIV, 1991; Board of Directors, 1990-91; Australasian Conference Co-Chair, 1991; Life Cycle Seminar, AURISA 1992 (Gold Coast, Australia); Strategic Planning (Telecom) Committee, 1997-2000, 2003-2007; Federal Liaison Advisory Committee, 2004-date (Chair, 2005-2007); Board of Directors (At Large member), 2006; Board of Directors (At Large member), 2007 (reappointment); Board of Directors (At Large member), 2008 (reappointment); Board of Directors (Secretary), 2009; Past-President, Central Florida Chapter, 2010; President-Elect (January-July), President (July-December) and Board of Directors, 2010; President and Board of Directors, 2011; Past-President and Board of Directors, 2012; organized and/or chaired multiple seminars and panel discussions; representative to Federal Geographic Data Committee (FGDC) Steering Committee (2006-2007)

Institute of Electrical and Electronics Engineers

Member, 1987-1992; Senior Member, 1992-2014 (retired)

Malaysian Branch, Royal Asiatic Society

Life Member since 1978

National States Geographic Information Council

Associate Member, 2008-2014 (retired)

Urban and Regional Information Systems Association

Member, 2008-2014 (retired)

OTHER PROFESSIONAL ACTIVITIES

National Geospatial Advisory Committee (NGAC) - Appointment by U.S. Secretary of the Interior Ken Salazar, 2010

Member, 2010-2012; Chair, Broadband Mapping Sub-committee, 2010; NGAC Broadband Mapping Liaison to FCC and NTIA, 2011, 2012; Member, Geospatial Platform Sub-committee, 2010; Member, Innovation Strategies Sub-committee, 2011; Co-chair, National Address Database Sub-committee, 2012, Chair, Geospatial Strategy Sub-committee, 2012

Reappointment by U.S. Secretary of the Interior Ken Salazar, 2013

Member, 2013-2015

Chairman of NGAC, 2013, 2014

U.S. Department of Commerce, National Telecommunications and Information Administration, State Broadband Data and Development Grant Program, Broadband Mapping Program, Technical Reviewer, 2009

American Council for Technology (ACT) Industry Advisory Council (IAC) Sub-committees: Homeland Protection (2005-2006), Emerging Technologies (2006), Enterprise Architecture (2006), GIS Committee, IAC Homeland Security SIG, 2005-2006

Oversight Committee, GIS Certification Institute, 2005

Founding participant, GITA/AAG/Wharton School Geospatial Industry Leadership Roundtable, 2005-2006

Participant, HIFLD, 2005-2007

Advisory Board, International Society of Spatial Sciences (a division of Community Systems Foundation), 1995-present

Editorial Board, *Solstice*, 1990-present

Editorial Board, *Equinox*, 1989-present

Editorial Board, Institute of Mathematical Geography, 1986-present

AWARDS

1992 AM/FM International Speaker Excellence Award

- 1992 Who's Who in Emerging Leaders in America (first inclusion)
- 1991 Pe. Roberto Landell de Moura Medal, CPqD Telebras, Brazil
- 1991 Who's Who in American Business Leaders (first inclusion)
- 1990 Who's Who in The Computer Industry (first inclusion)
- 1990 Who's Who in The South and Southwest (first inclusion)

PUBLICATIONS

Books

GIS for Critical Infrastructure Protection (with D. DiSera and T. Brooks), Boca Raton: Taylor and Francis, 2015 (in preparation).

Practical Handbook of Digital Mapping: Terms and Concepts (Specialist Associate Editor) (with S.L. Arlinghaus, Editor-in-Chief, and W.C. Arlinghaus, W.D. Drake, and J.D. Nystuen, Associate Editors), Boca Raton: CRC Press, 1994 (ISBN 0-8493-0131-9).

Published Papers, Monographs and Book Chapters

"A National Geospatial Strategy: Recommendations for the 2013-2016 Presidential Term," (with J Mahoney, J. Johnston, T. Gibbons *et al*), *National Geospatial Advisory Committee White Paper*, Washington, 2012. <<http://www.fgdc.gov/ngac/meetings/december-2012/NGAC%20Geospatial%20Strategy%20Paper.pdf>>

"Report on the Need for a National Address Database," (with E. Trobia, J Mahoney, T. Gibbons and National Address Database Subcommittee), *National Geospatial Advisory Committee White Paper*, Washington, 2012. <<http://www.fgdc.gov/ngac/meetings/december-2012/NGAC%20National%20Address%20Database%20Paper.pdf>>

"Guidelines for Geospatial Data Sharing," *Geospatial World Forum Proceedings*, Amsterdam, 2012.

"Applications of Geographic Information System (GIS) Technology in the City of Tampa" (with K. Wright), *Geospatial World Forum Proceedings*, Amsterdam, 2012.

"Inter-Agency Data Sharing - A Primer" (with L. Kurilla, C. Salas, J. Mahoney and T. Gibbons) *National Geospatial Advisory Committee White Paper*, Washington, 2011. <<http://www.fgdc.gov/ngac/ngac-interagency-data-sharing-primer-june-2011.pdf>>

"Best Practices For Local Government Geospatial Programs" (with B. Krucoff, J. Mahoney and T. Gibbons), *National Geospatial Advisory Committee White Paper*, Washington, 2011. <<http://www.fgdc.gov/ngac/ngac-local-gov-gis-best-practices-paper.pdf>>

"Southeast Asia: Historical Place Names Visualized in Google Earth" (with S.L. Arlinghaus), *Solstice*, XX: 2, December 2009 <<http://www.mylovedone.com/image/solstice/win09/Austin.html>> (Supplement to *A Historical Gazetteer of Southeast Asia*, Monograph No. 4, Institute of Mathematical Geography Monograph Series, Ann Arbor: Michigan Document Services, Inc., 1986).

"An Industry in Transition: Highlights of the 2006-2007 Geospatial Technology Report" (with M.A. Stewart), *DistribuTech 2008 Conference Proceedings*, Tampa, 2008.

- "Yet, A Better Way To Conversion: The Open, Incremental, GIS Free Approach (with G.C. Magalhães), *Geospatial Information & Technology Association Conference XXX Proceedings*, San Antonio, 2007
- "TRL – The Real Landbase: Enterprise Applications and Data Distribution," (with L. Bunting and K. Smyth), *Geospatial Information & Technology Association Conference XXVIII Proceedings*, 2005.
- "Mapping the Future with Geo-Spatial Information Technology" (with A. Robertson), *Pittsburgh Engineer*, Spring 2004. <http://www.eswp.com/PDF/PEspring04_10-11.pdf>
- "Photogrammetry and Topographic Mapping," (with S.L. Arlinghaus and J. Bethel), Chapter 147 in *The Engineering Handbook 2nd Edition*, Edited by Dorf, R., Boca Raton: CRC Press, 2004.
- "Satellite Surveying," (with B.H.W. van Gelder), Chapter 149 in *The Engineering Handbook 2nd Edition*, Edited by Dorf, R., Boca Raton: CRC Press, 2004.
- "Enabling Mobile Mapping" (with A. Quartararo), *GIS@development*, February 2004, pp. 19-24. <<http://www.gisdevelopment.net/magazine/gisdev/2004/feb/emm.shtml>>
- "LIDAR Applications in Telecom and Utilities," *The Future of Wireless: Business Strategies, Broadband Technologies and Network Operations*, International Engineering Consortium, 2003, pp. 169-173.
- "GIS in Oil and Gas Transport," *Business Briefing: Exploration and Production*, January 2003, pp. 56-58. <http://www.wmrc.com/businessbriefing/pdf/expl_prod_03/Pub/austin.pdf>
- "Cost Proxy Models in Rural Telephone Companies," *Solstice: An Electronic Journal of Geography and Mathematics*, Volume XIII, Number 2, December 2002. <<http://www-personal.umich.edu/~sarhaus/image/solstice/win02/Austin.PDF>>
- "Disaggregation and Targeting of Universal Service Support" (with P.E. Childers), *Solstice: An Electronic Journal of Geography and Mathematics*, Volume XIII, Number 2, December 2002. <<http://www-personal.umich.edu/~sarhaus/image/solstice/win02/austin2/austin2.htm>>
- "Spatial ASP - Enabling Mobile Mapping," *Geospatial Information & Technology Association Conference XXV Proceedings*, 2002.
- "Geographic Information Systems and the Telecommunications Bandwidth Explosion," *Conferencia Ejecutiva de Sistemas Integrados de Información (CESII) Conference Proceedings* (CD-ROM), Orlando, FL 1999.
- "Strategic Benefits of GIS in the Telecommunications Industry: The Example of SBC Communications," *Proceedings of A Symposium in Honor of John Nystuen*, Ann Arbor, MI, 1999.
- "GIS for Telecommunications: Learning Valuable International Lessons," *Conferencia Ejecutiva de Sistemas Integrados de Información (CESII) Conference Proceedings* (CD-ROM), Miami, FL 1998.
- Tri-Service Facility Management Standards (TSFMS)* (with J. Pitts) – *Communications Report*, Vicksburg, MS, U.S. Army Engineer Waterways Experiment Station, Tri-Service CADD/GIS

- Technology Center, 1998. [Incorporated in Spatial Data Standard for Facilities, Infrastructure and Environment (SDFIE), formerly known as Tri-Service Spatial Data Standards (TSSDS)]
- "Time Telekom's Network Inventory System: AM/FM/GIS in the Big Durian" (with Chin C.M.), *AM/FM International Automated Mapping/Facilities Management Conference XX Proceedings*, 681-690, 1997.
- "Mapping Malaysia's Telecommunications Infrastructure: GIS at TIME Telecommunications" (with Chin C.M.), *GIS Asia Pacific*, 2:3, 34-38, 1996 (June).
- "China: Spring Break '96," *KL American*, 24-27, 1996 (June/July).
- "The Laws of Project Management for Automated Record Systems," *Geo Info Systems Magazine*, 4:4, 1995 (April).
- "Estado Del Arte' Y Tendencias De La Tecnologia SIG A Nivel Mundial" ("State Of The Art Of GIS Technology"), *Plan De Accion Para La Implantacion De Las Tecnologias -- SIG AM/FM -- En Colombia: Diagnostico Y Recomendaciones*, CINTEL Seminario Internacional Santiago de Cali, Agosto 31-Septiembre 1y 2 de 1994, 33-42 (digital publication), 1994.
- "GIS for Fiber Loop Communications Systems: A Russian Case Study," *AM/FM International Automated Mapping/Facilities Management Conference XVII Proceedings*, 232-239, 1994; edited version published in *Intercarto Conference: GIS for Environmental Studies and Mapping Conference Proceedings* (Moscow State University), 79-83, 1994.
- "Training Doesn't Cost: It Pays," *AM/FM International Automated Mapping/Facilities Management Conference XVI Proceedings*, 399-408, 1993.
- "Principles of Ruggedization, or Field Access: The Last Piece in the Puzzle," *AM/FM International Automated Mapping/Facilities Management Conference XV Proceedings*, 51-60, 1992.
- "Digital Maps and Data Bases Constructed From Cartographic Sources versus Mechanically Drafted Sources: A Perspective on Aesthetics versus Accuracy," *Solstice*, II: 2, 31-37, 1991 (December 21).
- "AM/FM Needs of the 1990's," *Telephony*, 220:11, 124-128, 1991 (March 18).
- "GEMS in the Pines: GIS at Lufkin-Conroe Telephone Exchange," (with P. Singletary), *Geo Info Systems Magazine*, 1:2, 22-29, 1991 (February).
- "AM/FM at Coastal Utilities: A Profile in Development," *Outside Plant Magazine*, 29-33, 1989 (November).
- "Data Bases As the Basis for Geographical Information Systems: A Perspective," *GIS/LIS '89 Conference Proceedings*, 123-133, 1989.
- "GIS/LIS in the Long Distance Telecommunications Industry," *Third International GIS/LIS Conference (GIS/LIS '88) Proceedings*, 266-272, 1988.
- "Praxis as Teratism in Digital Cartography: GIS and AM/FM for the Long Distance Telecommunications Industry," *American Congress on Surveying and Mapping 1988 Fall Convention Proceedings*, 198-205, 1988.

- "Some Recent Developments in AM/FM Systems for Long Distance Carriers," *AM/FM International Automated Mapping/Facilities Management Conference XI Proceedings*, 21-31, 1988.
- "Outside Plant Record Management For Fiber Optic Networks: The MIRACLES AM/FM Project at MCI," (with C.H. Sauer III), *AM/FM International Automated Mapping/Facilities Management Conference X Proceedings*, 17-27, 1987.
- A Historical Gazetteer of Southeast Asia*, Monograph No. 4, Institute of Mathematical Geography Monograph Series, Ann Arbor: Michigan Document Services, Inc., 1986. Available at: <http://www-personal.umich.edu/~sarhaus>.
- "Service Ace," [letter] *Telephony*, 210:5, 12, 1986 (February 3).
- "Raster/Vector Systems in a Production Environment," *URISA and Regional Information Systems Association Conference Papers*, 4, 203-211, 1985.
- "Making Maps with Databases," *Telephony*, 208:19, 34-39, 1985 (May 13).
- "Raster Systems in a Production Environment," *Design Graphics World*, 9:3, 10-15, 1985.
- "An 'Everyday Atlas'," *Journal of Geography*, 83:4, 173-174, 1984.
- "Measuring and Comparing Two-Dimensional Shapes," in Gaile, G.L. and Willmott, C.J. (editors), *Spatial Statistics and Models*, Dordrecht: D. Reidel Publishing, 293-312, 1984.
- Bibliography of Measures of Spatial Shape*, Vance Bibliographies No. P-1142 (Public Administration Series), Monticello, IL, 18 pp., 1983.
- "Reply To Phillips," *The Professional Geographer*, 35:2, 195-196, 1983.
- Cartography* (independent study course book, University of Missouri, Center for Independent Study), 1983.
- "A Definition and Estimate of Temporal Area," *The Professional Geographer*, 34:3, 297-304, 1982.
- "On Contiguity, Contact Number and Compactness (Reply To Boots and Blair)," *Area*, 14:2, 127-131, 1982.
- "Comment on 'Undocumented Migration from Mexico: Some Geographical Questions'," *Annals of the Association of American Geographers*, 72:4, 559-560, 1982.
- "The Compactness of Missouri's Counties," (with T. Dowell) *Transactions of the Missouri Academy of Science*, 16, 127-130, 1982.
- "The Shape of West Malaysia's Districts," *Area*, 13:2, 145-150, 1981.
- "Measures of Population Concentration," *Oxford Polytechnic Geography Discussion Paper No. 15*, 33 pp., 1981.
- "Comments on Sopher's Measure of Disparity," *The Professional Geographer*, 32:3, 370-371, 1980.

A Directory of Missouri Data Sources (senior author and project director), Jefferson City: Missouri Office of Administration, 318 pp. (NSF ISP78-03201/NSF7901), 1979.

Revised and edited seven chapters in *Missouri Corporate Planner*, Jefferson City: State of Missouri, Division of Commerce and Industrial Development, 1979.

"Spatial Concentration and Productivity in the Brewing Industry of Missouri," *Transactions of the Missouri Academy of Science*, 12, 137-143, 1978.

Industrial Location Study, "Automobile Factory," Missouri Division of Commerce and Industrial Development, Jefferson City, MO, 202 pp., 1978.

Seven confidential industrial location studies for the Missouri Division of Commerce and Industrial Development: Prospect No. 32 (factory), 86 pp.; Prospect No. 34 (foundry), 57 pp.; Prospect No. 35 (factory), 54 pp.; Prospect No. 38 (factory), 56 pp.; 3 additional shorter studies, 1978.

"Cohort Survival Ratios and the 1970 Age Structure of Sarawak's Population," *Borneo Research Bulletin*, 9:1, 16-22, 1977.

"Some Demographic Characteristics of the Iban Population of Brunei, Part II: 1960-1971," *Brunei Museum Journal*, 4:1, 1-6, 1977.

Iban Migration: Patterns of Mobility and Employment In the 20th Century, Ph.D. dissertation, Department of Geography, University of Michigan, 1977. (University Microfilms: UM77-17945) [Abstracted in *Dissertation Abstracts International*, 38:3, 1654-A and *Borneo Research Bulletin*, 10:1, 49-50.]

"Recent Malaysian Government Publications Dealing with Population in Borneo," *Borneo Research Bulletin*, 8:1, 18-22, 1976.

"Some Demographic Characteristics of the Iban Population of Brunei, Part I: 1947-1960," *Brunei Museum Journal*, 3:5, 64-69, 1976.

"Some Notes on the Role of the Iban in the North Borneo Police Force," *Sarawak Museum Journal*, 45, 315-316, 1976.

"A Review Article on the Iban of Sarawak," *Southeast Asia, An International Quarterly*, 3:3, 905-917, 1974.

(Book review) *West Malaysia And Singapore: A Selected Bibliography*, by Karl Pelzer, *Southeast Asia, An International Quarterly*, 3:2, 797-798, 1974.

HANDBOOKS, MANUALS, AND TECHNICAL REPORTS

Greenhorne & O'Mara *APFO CLU Digitizing Project Management Plan*, 2003.

KNT Network Technologies *Outside Plant Engineering Handbook*, 2000.

Engineering Evaluation of Cost Proxy Models For Determining Universal Service Support: Hatfield Model Version 5.0, Benchmark Cost Proxy Model Version 3.0 And Hybrid Cost Proxy Model 2.0,

January 14, 1998, *Ex Parte* Filing on behalf of United States Telephone Association to the Federal Communications Commission, FCC Dockets Nos. 96-45, January 15, 1998.

Comment on the Hybrid Cost Proxy Model for Determining Universal Service Support for Non-Rural Carriers: The CENBLOCK and FEEDDIST Software Modules, December 2, 1997, *Ex Parte* Filing on behalf of United States Telephone Association to the Federal Communications Commission, FCC Dockets Nos. 96-45 and 97-160, December 3, 1997.

Comments On An Ex Parte Presentation By AT&T and MCI to the FCC Common Carrier Bureau March 18, 1997, *Ex Parte* Filing on behalf of United States Telephone Association to the Federal Communications Commission, FCC Docket No. 96-45, April 23, 1997.

Engineering Evaluation of Cost Proxy Models for Determining Universal Service Support: Hatfield Model 3.0/3.1 (Principal Investigator), *Ex Parte* Filing on behalf of United States Telephone Association to the Federal Communications Commission, FCC Docket No. 96-45, April 9, 1997.

Engineering Evaluation of Cost Proxy Models for Determining Universal Service Support: Benchmark Cost Proxy Model (Principal Investigator), *Ex Parte* Filing on behalf of the United States Telephone Association to the Federal Communications Commission, FCC Docket No. 96-45, April 9, 1997.

On the Adverse Effects of Continuing Temporary Cost Subsidies to the Commercial Internet Service Industry, *Ex Parte* Filing on behalf of the United States Telephone Association to the Federal Communications Commission, FCC Docket No. CC. No. 96-263, March 24, 1997.

Engineering Evaluation of Cost Proxy Models for Determining Universal Service Support: Hatfield Model 2.2, Release 2 (Principal Investigator), *Ex Parte* Filing on behalf of the United States Telephone Association to the Federal Communications Commission, FCC Docket No. 96-45, February 5, 1997.

"Digital Cartography in the Telecommunications Industry: A Glossary of Terms, Acronyms and Abbreviations," *Baystar Service Corporation Occasional Paper*, 1988.

MCI Transmission Systems *Outside Plant Construction Policies and Procedures Manual*, 1987.

MCI Transmission Systems *Outside Plant Field Construction Handbook* (second edition), 1987.

MCI Lightwave Systems *Outside Plant Restoration Manual*, 1986.

MCI Lightwave Systems *Outside Plant Construction Handbook*, 1986.

MCI Lightwave Systems *Outside Plant Engineering Handbook*, 1986.

MCI Lightwave Systems *Outside Plant Broadgauge Unit Price Schedule*, 1986.

"Land Base Construction for Public Utilities" (with J. Pinello), *CAS Production Report No. 403*.

"Telephone Records Conversion," *CAS Production Report No. 404*, 1985.

"Raster/Vector Systems Transfer Procedures," *CAS Production Report No. 211*, 1985.

"Computer Software: An Overview," *CAS Production Report No. 108*, 1985.

"Map Design and Aesthetics," *CAS Production Report No. 109*, 1985.

"Customary Filename Extensions at CAS," *CAS Production Report No. 111*, 1984.

"Digital Cartography at CAS - A Glossary of Terms and Acronyms," *CAS Production Report No. 110*, 1984.

"Raster Systems in A Production Environment," *CAS Production Report No. 210*, 1984.

UNPUBLISHED CONFERENCE PAPERS AND PRESENTATIONS

"Tampa RNC 2012 – Benefits of Common Geo Foundation Data," *GEOINT 2013* Conference - National Security Workshop*, Tampa, 2014

"Inputs to the FGDC Regarding a Strategic Vision for the Nation," *GEOINT 2013* Conference*, Tampa, 2014.

"The TIGER System Developed in Preparation for the RNC," *GEOINT 2013* Conference*, Tampa, 2014.

"Geospatial Data Policy: Federal Agencies and Non-Federal Advisors," (with Milo Robinson), *Association of American Geographers Annual Conference*, Tampa, 2014.

"Geospatial Data Policy: Federal Agencies and Non-Federal Advisors," guest lecture to *University of South Florida GIS Seminar*, November 2013.

"GIS in the Public Sector," guest lecture to *University of South Florida GIS Seminar*, September 2013.

"GIS in the Private and Public Sectors," presentation to *Tampa Bay Technology Leadership Association*, 2013.

"[Four View of GIS – Updated](#)," Keynote Address, National States Geographic Information Council Annual Meeting, Orlando, 2012.

"Where We've Been and Where We're Going: The Changing Geospatial Industry," Presidential Address," *GITA Geospatial Solutions Conference*, Grapevine (Dallas), 2011.

"The Tampa Bay GECCo – Lessons Learned," Geospatial Dimensions, Relationships and Interdependencies of Your Critical Infrastructure Workshop," *GITA Geospatial Solutions Conference*, Grapevine (Dallas), 2011.

"Panel: Bird's Eye View: The Critical Role Of Geospatial Information To Protect Our Nation's Infrastructure" (with J. Sherin, R. Driggers, W. Watson), *2010 CIP Conference: Manage Risk with Resilience*, Washington, 2010.

"Geospatial Data Management in the City of Tampa," presentation to *ASPRS/CaGIS 2010 Fall Specialty Conference*, Orlando, 2010.

"The Geospatial Information & Technology Association's GECCo Initiative - Status and Update," *Homeland Infrastructure Foundation-Level Database (HIFLD) Working Group*, Washington, 2010.

"[Four Views of GIS](#)," Keynote Address to *Central Florida GIS Workshop*, Daytona Beach, 2010.

"Some Thought on Geospatial Intelligence," presentation to *Society of American Military Engineers - Tampa Bay Post*, MacDill AFB, Tampa, 2010.

"Panel: Driven by Data: Who Pays, Who Plays?" (Moderator, with J. Fee, R. Young, R. Stricklan), *GITA Geospatial Infrastructure Solutions Conference*, Phoenix, 2010.

"GIS Technology: What Is It Now... and Where Is It Going?," presentation to *Society of American Military Engineers - Tampa Bay Post*, MacDill AFB, Tampa, FL, 2008.

"Power Panel: The Ties That Bind: GIS Technology for "The Greater Good" (with M. Ball, R. Langhelm, T. Nyerges), *GITA Geospatial Infrastructure Solutions Conference*, Seattle, WA, 2008.

"Overview: Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) Services Support," *Environmental Systems Research Institute Conference*, San Diego, CA, 2007.

"Recent Advances in GIS Application Development," *National State Geographic Information Council (NSGIC) 16th Annual Conference*, Little Rock, AR, 2006

"Coordination and Access to Geospatial Data Through Metadata Catalogs, While Using NSDI and GOS," (with R. Hanson and J. Tornatore), *National States Geographic Information Council (NSGIC) 15th Annual Conference*, Rochester, NY, 2005.

"SBC West: Going Beyond the Call," (with L. Bunting, J. Smith and M. Adkins), *Environmental Systems Research Institute, Telecom and Location Based Services Summit*, San Diego, CA, 2005.

"A Community Framework for Critical Infrastructure Protection: The GECCo Initiative," *Homeland Infrastructure Foundation-Level Database (HIFLD) Working Group*, 2005.

"Enterprise Landbase Development," *Nevada Telecommunications Association*, Reno, NV, 2004.

"Enterprise Landbase Development," *Environmental Systems Research Institute, Telecom and Location Based Services Summit*, San Diego, CA, 2004.

"Enterprise Landbase Development: Leveraging the Investment," *Geospatial Information & Technology Association Conference*, Seattle, WA, 2004.

"The Benefits of GIS for Outside Plant, Campus and Building Networks," *Annual International BICSI Conference*, TN, 2003

"The FCC Order Regarding the Multi-Association Group (MAG) Plan," *USDA RUS CPA 2002 Seminar Series*, Seattle, WA, St. Petersburg, FL and Austin, TX 2002.

"Geographic Information Systems and the Bandwidth Explosion," *Cambridge Communications Group Conference: The Bandwidth Explosion: Understanding New Technologies That Are Driving Business Opportunities*, Washington, DC, 1998.

- "GIS for Telecommunications: Learning Valuable International Lessons," *Keynote Address, Institute for International Research Conference: Capitalizing on Geographic Information Systems for Telecom and Utilities*, Arlington, VA, 1998.
- "It's Your Dime, Start Talking: Billing Problems around the World," *United States Telephone Association Billing and Customer Care Issues Conference*, New Orleans, LA, 1997.
- "The Convergence of Technologies and Industries," *Keynote Address, 1995 Cadtel Users Conference*, Phoenix, AZ, 1995.
- "Supplementary Applications that Influence AM/FM/GIS Development," *AM/FM International Automated Mapping/Facilities Management Conference XVI*, (Seminar VII: Organizer, Moderator, and Presenter), Orlando, FL, 1993.
- "Environmental Conditioning for Field Computing," *GIS/LIS '92 Conference*, San Jose, CA, 1993.
- "GIS For Business And As A Business," *Computing for the Social Sciences, Third Annual Conference*, Ann Arbor, Michigan, 1992.
- "Computer Mapping as a Decision Making Tool," *18th Annual International BICSI Conference*, Tampa, Florida, 1990.
- "Maps and Data Bases as Tools for Development: An Overview," *Association of American Geographers Annual Conference*, Detroit, MI, 1985.
- "American Breweries in the Post Industrial Age," (with J. Koerner and D. Rhynsburger), *Association of American Geographers Annual Conference*, Louisville, KY, 1980.
- "Iban Migration in Sarawak, East Malaysia," *Association for Asian Studies Annual Conference*, Los Angeles, CA, 1979.
- "Estate and Smallholder Rubber Production in Thailand and Indonesia," *Association of American Geographers Annual Conference*, Philadelphia, PA, 1979.
- "Southeast Asian Toponyms: An Introduction," *West Lakes Region, Association of American Geographers Annual Conference*, Mankato, MN, 1978.
- "Anisometric Interaction Fields and the Gravity Model," *West Lakes Region, Association of American Geographers Annual Conference*, Valparaiso, IN, 1977.
- "In Defense of Shifting Cultivation," *Association of American Geographers Annual Conference*, Salt Lake City, UT, 1977.
- "Stress and Internal Migration in Sarawak, East Malaysia: The Case of the Iban," *East Lakes Region, Association of American Geographers Annual Conference*, Ann Arbor, MI, 1976.

CONSULTING PROJECT EXPERIENCE

[Selected project listed in alphabetical order by Client Company]

CLIENT: Alltel Carolina/Alltel Southern Region (telephone operating company and service corporation)

Project Title: CAD/E

Project Focus: outside plant

Project Manager: Bobby Woodard, Alltel Carolina, PO Box 428, Matthews, NC 28106 USA

Hardware/Software: Intergraph workstations, Intergraph FRAMME

Services: training

Dates of Service: 1991

CLIENT: Ameritech Services, Inc. (telephone service corporation)

Project Title: AIRS

Project Focus: outside plant

Project Manager: Timothy Andres, Ameritech Services, 1900 East Golf Road, Schaumburg, IL 60173 USA

Hardware/Software: Intergraph workstations, Intergraph FRAMME

Services: technology assessment, training

Dates of Service: 1990

CLIENT: Andrew Corporation (telephone competitive access provider and long distance company)

Project Title: Russian Joint Venture Information Systems

Project Focus: OSP for SDH

Project Manager: Ed Beavers, Andrew Corporation, 32A Leninski Prospekt, Moscow, RUSSIA

Hardware/Software: various microcomputers, Cadtel, AutoCAD, ArcCad

Services: technology assessment, system design, training

Dates of Service: 1993-1994

CLIENT: Antigua Public Utilities Authority Company (public utilities and telephone company)

Project Title: N/A

Project Focus: outside plant

Project Manager: Brian G. Larkin, Antigua Telephones, PO Box 416, Saint John's, ANTIGUA

Hardware/Software: microcomputers

Services: consulting, training

Dates of Service: 1995

CLIENT: Army Corps of Engineers (U.S. federal government agency)

Project Title: SDSFIE

Project Focus: creation, update and promulgation of spatial data standards for U.S. military

Project Manager: Design team led by Marc R. Beckel, Manager, Spatial Data Solutions, Northrop-Grumman, Information Technology, TASC, 15036 Conference Center Drive, Chantilly, VA 20151 USA

Hardware/Software: microcomputers

Services: participant in design team

Dates of Service: 2006-2007

CLIENT: AT&T - EDDS (telephone service corporation)

Project Title: (prototype system)

Project Focus: outside plant

Project Manager: Erv Thompson, AT&T-EDDS, 4 Wood Hollow Road, Parsippany, NJ 07054 USA
Hardware/Software: various processors, including VAX and Cray, Syscan (data capture and vectorization), proprietary data base manager, customized AM/FM/GIS software
Services: definition of data base structures and code lists, definition of feature rules, definition of graphics specifications, prototype system design, technology assessment, training
Dates of Service: 1988-1989

CLIENT: Baker Engineering (engineering company)

Project Title: TriService CADD-GIS for USAE Waterways Experiment Station

Project Focus: AM/FM-GIS system design

Project Manager: Robert Hanson, Michael Baker, Jr., 2925 Layfair Drive, Jackson, MS 39208 USA

Hardware/Software: Intergraph, ESRI, Bentley, others

Services: design and specification of master database for communications systems for TriService CADD-GIS project (DOD)

Dates of Service: 1997-98

CLIENT: Barbados Telephone Company (telephone operating company)

Project Title: N/A

Project Focus: outside plant

Project Manager: Edwin Layne, Barbados Telephone Company, PO Box 272, St. Michael, BARBADOS

Hardware/Software: microcomputers, DEC workstations, GeoVision software

Services: consulting, system design, technology assessment, training

Dates of Service: 1991-1993

CLIENT: C3 (computer hardware manufacturer)

Project Title: Market Analysis Study - Portable Graphics Workstations

Project Focus: equipment design and marketing

Project Manager: David Shepherd, C3, Inc., 460 Herndon Parkway, Herndon, VA 22070 USA

Hardware/Software: Intel and SPARC processors ruggedized for field use

Services: feasibility study, market analysis, product development, product marketing, technology assessment, training

Dates of Service: 1991-1992

CLIENT: CDI Telecommunications (telecommunications engineering services company)

Project Title: N/A

Project Focus: outside plant

Project Manager: Bradley Cranston, CDI Telecom, 311 Park Place Boulevard, Clearwater, FL 34619 USA

Hardware/Software: various microcomputers, Microstation, GTEDS IDDS

Services: market analysis, technology assessment, training

Dates of Service: 1991-1992

CLIENT: CFW Telephone Company (telephone operating company)

Project Title: N/A

Project Focus: outside plant

Project Manager: Peter H. Coffey, CFW Telephone, PO Box 1527, Waynesboro, VA 22980 USA

Hardware/Software: IBM A/S 400, microcomputers

Services: technology assessment, training

Dates of Service: 1990

CLIENT: Coastal Utilities, Inc. (telephone operating company)

Project Title: AM/FM system

Project Focus: outside plant

Project Manager: Michael Valentine, Coastal Utilities, PO Box 585, Hinesville, GA 31313 USA

Hardware/Software: Intergraph VAX system, Intergraph FRAMME, IBM A/S 400

Services: consulting during preparation of rules base, definition of data definition language, definition of external code lists, definition of graphics specifications, preparation of conversion specifications, preparation of land base specifications, training

Dates of Service: 1989-1991

CLIENT: CSC Intelicom (computer software vendor)

Project Title: Market Opportunities

Project Focus: work force management software and outside plant data field access software

Project Manager: Peter Winder, CSC Intelicom, 6707 Democracy Boulevard, Bethesda, MD 20817 USA

Hardware/Software: various workstations and microcomputers, UNIX, C, 4-GLs

Services: acquisition evaluations, joint venture evaluations, marketing, consulting, technology assessment, training

Dates of Service: 1992

CLIENT: Edmonton Telephones (telephone operating company) [now BCT.Telus]

Project Title: several

Project Focus: outside plant

Project Manager: Claude Mollot, EdTel, 10044 108th Street, Edmonton, Alberta, T5J 3S7 CANADA

Hardware/Software: Various processors, Enghouse CableCad (T)

Services: consulting, preparation of RFP, training, validation of data base structure, validation of code lists, validation of graphics specifications

Dates of Service: 1991-1992

CLIENT: Enghouse Systems (computer software vendor)

Project Title: TelcoWORKS

Project Focus: outside plant

Project Manager: Dr. Andrew Nellestyn, Enghouse Systems, 80 Tiverton Court, #800, Markham, Ontario, L3R 0G4 CANADA

Hardware/Software: TelcoWORKS

Services: definition of data base structure, definition of external code lists, definition of feature rules, marketing, specification of GIS and telephone applications

Dates of Service: 1999-2000

CLIENT: Environmental Protection Agency (U.S. federal government agency)

Project Title: Geospatial Blueprint Update

Project Focus: Enterprise GIS

Project Manager: Brenda Smith and Wendy Blake-Coleman, EPA, 1201 Constitution Ave NW, Washington, DC 20460 USA

Hardware/Software: servers and microcomputers, ESRI, Oracle

Services: evaluation and update of agency's primary GIS deployment guidelines

Dates of Service: 2005-2006

CLIENT: Fail Engineering Company (telecommunications engineering services company, telephone operating company consortium, holding company)

Project Title: N/A

Project Focus: outside plant

Project Manager: Bobby Hinton, Fail Engineering, PO Box 925, Bay Springs, MS 39422 USA

Hardware/Software: microcomputers

Services: technology assessment, training

Dates of Service: 1990

CLIENT: Farm Service Agency, Aerial Photography Field Office (APFO) (federal government agency)

Project Title: CLU Photomap Project

Project Focus: scanning and digitizing common land use aerial photomaps

Project Manager: Jeanette Tolliver, 2222 West 2300 South, Salt Lake City, UT 84119-2020, USA

Hardware/Software: Colortrac scanners, Rocket controllers

Services: task manager responsible for equipment specification and acquisition, personnel staffing, logistics and on-site management of field scanning team for the APFO CLU digitizing project

Dates of Service: 2003

CLIENT: Generation 5 Technology (computer software vendor)

Project Title: N/A

Project Focus: outside plant

Project Manager: Mark Wilding, G5 Technology, 8670 Wolff Court, Westminster, CO 80030 USA

Hardware/Software: GeoSQL, Oracle, AutoCAD

Services: definition of data base structure, definition of external code lists, definition of feature rules, definition of graphics specifications, marketing, design telephone applications

Dates of Service: 1991-1992

CLIENT: GeoTechnology International (cartographic data conversion service bureau)

Project Title: several

Project Focus: outside plant

Project Manager: Charles Rolling, GeoTechnology Intl., 3637 Medina Road, Medina, OH 44256 USA

Hardware/Software: Intergraph VAX systems, Intergraph FRAMME, IBM systems and Enghouse software, Data General hardware and proprietary software

Services: as-built production, edit verification, outside plant engineering, record posting and record scrub, technology assessment, work order posting

Dates of Service: 1989-1991

CLIENT: GeoVision Systems (computer software vendor)

Project Title: DEWS, VISION*

Project Focus: outside plant

Project Manager: Perry Evans, GeoVision Systems, 5251 DTC Parkway, Englewood, CO 80111 USA

Hardware/Software: various processors, DEWS, AMS/ GIS, VISION*

Services: market analysis, technology assessment, training

Dates of Service: 1991-1992

CLIENT: GST Telecommunications (competitive local exchange carrier and long distance carrier)

Project Title: TBD

Project Focus: outside plant and fiber management

Project Manager: Dana Coulter, GST Telecom, 4001 Main Street, Vancouver, WA 98663 USA

Hardware/Software: evaluation study

Services: technology assessment, system design, prototype definition
Dates of Service: 2000

CLIENT: GTE Data Services (telephone service corporation)

Project Title: IDDS

Project Focus: AM/FM system software

Project Manager: Gerald Schick, GTEDS, 12470 E Telcom Parkway, Temple Terrace, FL 33687 USA

Hardware/Software: Intergraph VAX systems, Intergraph T-FIDS, Microstation PC, Microstation 32, MicroIDDS (MicroCapture, MicroCert, MicroWPG)

Services: market analysis, marketing services, product evaluation, software beta testing, technology assessment

Dates of Service: 1989-1991

CLIENT: GTE-Florida (GTE South Area) (telephone operating company)

Project Title: ICGS

Project Focus: outside plant

Project Manager: David Lane, GTE South Area, PO Box 110, Tampa, FL 33601 USA

Hardware/Software: Intergraph VAX systems, Intergraph T-FIDS (009 GTE specifications)

Services: on-premise digitizing, preparation of land base specifications, record posting, work order posting

Dates of Service: 1987-1991

CLIENT: GTE-Florida (GTE South Area) (telephone operating company)

Project Title: Planning-ICGS Interface

Project Focus: network planning

Project Manager: James Englert, GTE South Area, PO Box 110, Tampa, FL 33601 USA

Hardware/Software: Intergraph VAX, Intergraph T-FIDS (009 GTE specs), Microstation

Services: definition of data definition language and code lists, definition of graphics specifications, preparation of conversion specifications, training

Dates of Service: 1989-1990

CLIENT: Incatel (computer software vendor)

Project Title: North American market assessment

Project Focus: outside plant and inside plant

Project Manager: Odd Vedeld, President, Incatel AS, Hamangskogen 60, Sandvika, 1338 NORWAY

Hardware/Software: InCA, InRA

Services: marketing, specify GIS and telephone applications

Dates of Service: 1998-1999

CLIENT: KNT Network Technologies and KMC Telecom (competitive local exchange carrier)

Project Title: N/A

Project Focus: outside plant

Project Manager: Tom Drolet, 2875 Breckenridge, Suite 210, Duluth, GA 30096 USA

Hardware/Software: client-servers microcomputer, AutoCAD, MapInfo

Services: definition of data base schema, code lists, graphics specifications, preparation of land base and conversion specifications, vendor and technology assessment, training, technology evaluation

Dates of Service: 2000

CLIENT: Lambda Tech International (technology development company)

Project Title: GPSVision

Project Focus: mobile GPS data collection

Project Manager: David Baraniak, President, W239 N1812 Rockwood, Waukesha, WI 53188 USA

Hardware/Software: N/A

Services: marketing, product development

Dates of Service: 1994-1995

CLIENT: LCTX (formerly, Lufkin-Conroe Telephone Exchange) (telephone operating company)

Project Title: GEMS

Project Focus: outside plant

Project Manager: Pat Singletary, LCTX, PO Box 1568, Conroe, TX 77305 USA

Hardware/Software: IBM RT/IBM RS 6000, GeoVision DEWS (GIS and AMS), IBM A/S 400

Services: definition of data base schema, code lists, graphics specifications, preparation of land base and conversion specifications, vendor and technology assessment, training

Dates of Service: 1989-1991

CLIENT: Macomnet (carrier's carrier and CLEC), Rascom (carrier's carrier and long distance carrier), Metrokom (carrier's carrier and CLEC), Kancom (carrier's carrier and CLEC)

Project Title: AM/FM-GIS

Project Focus: outside plant, SDH loop analysis

Project Manager: Dr. Robert Austin, Andrew Corporation, 32A Leninski Prospekt, Moscow, RUSSIA

Hardware/Software: various microcomputers, Cadtel Logic

Services: as-built production, definition of data definition language, code lists, and graphics specifications, system administration, training

Dates of Service: 1993-1994

CLIENT: MCI Telecommunications (long distance carrier)

Project Title: MIRACLES

Project Focus: outside plant, right-of-way

Project Manager: Jim Tatum, MCI, 400 International Parkway, Richardson, Texas 75081 USA

Hardware/Software: Intergraph VAX systems, Intergraph FRAMME, various microcomputers

Services: as-built production, consulting on rules base, definition of data definition language, code lists, and graphics specifications, edit verification and acceptance testing, on-premise digitizing, preparation of land base and conversion specifications, record posting and record scrub, vendor evaluations, technology assessment, training

Dates of Service: 1985-1991

CLIENT: MSE Corporation (cartographic data conversion service bureau)

Project Title: NA

Project Focus: outside plant

Project Manager: Robert Meister, MSE Corporation, 941 North Meridian Street, Indianapolis, IN 46204 USA

Hardware/Software: Intergraph VAX systems, Intergraph FRAMME

Services: record posting and record scrub

Dates of Service: 1989

CLIENT: Nevada Bell (telephone operating company)

Project Title: none

Project Focus: outside plant

Project Manager: Lesa Bunting, Nevada Bell Telephone, 645 E Plumb Lane, Reno, NV 89520 USA

Hardware/Software: evaluation study

Services: technology assessment, system design, prototype definition, training

Dates of Service: 1997-1999

CLIENT: New England Telephone (telephone operating company)

Project Title: Central Artery Division Project

Project Focus: outside plant

Project Manager: Robert Bentley, New England Telephone, 425 Summer Street, Boston, MA 02210 USA

Hardware/Software: evaluation study

Services: technology assessment, training

Dates of Service: 1990

CLIENT: Pacific Bell - North Coast (telephone operating company)

Project Title: MRD

Project Focus: outside plant

Project Manager: Wendy Cline, Pacific Bell, 2125 Occidental Road, Santa Rosa, CA 95401 USA

Hardware/Software: various microcomputers, Enghouse CableCad (T) software

Services: consulting, preparation of land base specifications, preparation of request for quotations, training, vendor evaluations

Dates of Service: 1991-1992

CLIENT: Pacific Bell - Valley Central Coast (telephone operating company)

Project Title: CAFM

Project Focus: outside plant

Project Manager: Chris Downs, Pacific Bell, 217 West Acequia, Floor 1, Visalia, CA 93291 USA

Hardware/Software: various microcomputers, Enghouse CableCad (T) software

Services: consulting, preparation of land base specifications, preparation of request for quotations, training, vendor evaluations

Dates of Service: 1991-1992

CLIENT: Pacific Bell - Orange-Riverside (telephone operating company)

Project Title: NA

Project Focus: outside plant

Project Manager: Bob Barnett, Pacific Bell, 3939 East Coronado, Anaheim, CA 92807 USA

Hardware/Software: N/A

Services: consulting, preparation of hardware/software specifications, training, vendor evaluations

Dates of Service: 1992-1993

CLIENT: Pacific Bell (telephone operating company)

Project Title: none

Project Focus: outside plant

Project Manager: Nancy Gratton, Pacific Bell, 2600 Camino Ramon Boulevard, Room 2N000T, San Ramon, CA 94583-5041 USA

Hardware/Software: Intergraph G-FRAMME

Services: system design, prototype

Dates of Service: 1999-2000

CLIENT: SaskTel (telephone operating company)

Project Title: STAGES

Project Focus: outside plant

Project Manager: Glen Squires, SaskTel, 2121 Saskatchewan Drive, Regina, SK, S4P 3Y2
CANADA

Hardware/Software: various processors, software selection progress

Services: consulting, feasibility analysis, software evaluation, technical assessment, training

Dates of Service: 1992-1993

CLIENT: Southern Company (electric utility)

Project: Enterprise GIS

Project Focus: Enterprise integration of GIS for distribution, transmission, real estate (including lands) and other business units

Project Manager: Billy R. Hall, Jr., Southern Company, 600 N 18th Street, Birmingham, AL 35291-8485 USA

Hardware/Software: Microcomputers and workstations, ESRI (various), Intergraph (In-service), GE Network Solutions, others

Services: Architectural design, implementation planning

Dates of Service: 2003-2004

CLIENT: Southern Bell Telephone (telephone operating company)

Project Title: PLRMS

Project Focus: outside plant

Project Manager: Joyce Rector, Southern Bell Telephone, 675 West Peachtree Street, Atlanta, GA 30375 USA

Hardware/Software: Intergraph VAX systems, Intergraph T-FIDS

Services: data conversion, record posting and record scrub, technical assessment, work order posting

Dates of Service: 1984-1985

CLIENT: Southwestern Bell Telephone (telephone operating company)

Project Title: 911-EMS

Project Focus: 911-EMS

Project Manager: Bill Horne, Southwestern Bell Telephone, 2401 East Randol Mill, Arlington, TX 76011 USA

Hardware/Software: N/A

Services: technology assessment, training

Dates of Service: 1988-1989

CLIENT: Southwestern Bell Telephone (telephone operating company)

Project Title: DEWS/MPLR

Project Focus: outside plant

Project Manager: Antonio Gaber, Southwestern Bell Telephone, 308 South Akard, Dallas, TX 75202 USA

Hardware/Software: MPLR (Data General and proprietary), GeoVision DEWS (GIS and AMS)

Services: work order posting (sub-contract)

Dates of Service: 1990

CLIENT: TELEBRAS CPqD (Brazilian national telephone company holding corporation)

Project Title: SAGRE

Project Focus: outside plant

Project Manager: Dr. Geovane Magalhaes, Telebras CPqD, Caixa Postal 1579, Campinas 13085

SP, BRAZIL

Hardware/Software: various processors, GeoVision DEWS and VISION*, custom OSP software

Services: consulting, technology assessment, training

Dates of Service: 1991-1992

CLIENT: Tensing-SKS (computer software vendor)

Project Title: North American market assessment

Project Focus: outside plant and inside plant

Project Manager: Jan Scheurwater, Managing Director, Tensing-SKS, Wielkamp 3A, Zaltbommel,
5301 DB, THE NETHERLANDS

Hardware/Software: Spy

Services: marketing support

Dates of Service: 1999

CLIENT: TIME Quantum Technology/TIME Telekom (information systems division of telecommunications services company)

Project Title: Network Inventory System (NIS)

Project Focus: GIS for SDH

Project Manager: Chin Choon Moy, TQT, Floor 6, Menara Maxisegar, Jalan Pandan Indah 4/2,
55100 Pandan Indah, Kuala Lumpur, MALAYSIA

Hardware/Software: SUN workstations, Enghouse Geonet software, Oracle DBMS

Services: consulting, system design, technology assessment, training

Dates of Service: 1995-1996

CLIENT: United States Telephone Association (industry information organization)

Project Title: Proxy Model Advisory Group

Project Focus: network cost models

Project Manager: Porter Childers, 1401 H Street NW, Suite 600, Washington, DC 20005-2136
USA

Hardware/Software: N/A

Services: technology assessment, evaluation of network construction cost proxy models

Dates of Service: 1997-1999