Howard L. Ward, GISP
President

Education
BS, Natural Resources
Planning,
Humboldt State University

Masters of Business
Administration,
University of Arizona

Affiliations
Tucson Clean and Beautiful
Vice President, Executive
Board (11 years)

Arizona Geographic
Information Council – Private
Sector Representative

Past President, AZ Chapter of
Geospatial Information
Technology Association

Associate Member, Arizona
Public Land Surveyors

Certifications
Certified Geographic
Information Systems
Professional (GISP) by the
GIS Certification Institute

23 Years Experience

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Mr. Ward has been a practicing GIS professional for more than 20 years, five years of which he served as the GIS Manager for the Pima County Department of Transportation. While at PCDOT, he directed the creation of the multi-million dollar parcel and street network databases, and developed and marketed the Pima County Land Information System (PCLIS) CD.   As principal of TSSW, Mr. Ward has conducted hundreds of GIS support projects since 1998, ranging from simple data acquisition and conversion to complex application development. Mr. Ward is active in several statewide GIS professional organizations and has developed an extensive network of public and private GIS experts and data providers throughout Arizona and the United States. He is currently the private sector representative to the Arizona Geographic Information Council, a Governor-appointed position charged with statewide GIS Coordination.

Mr. Ward began his career as a long range planner for Pima County Planning and Development Services.   He has participated in the research, preparation and presentation of land use studies and general plans and their updates in Arizona, California, and New Mexico.

Selected Project Experience

State of Arizona – Arizona Broadband Mapping Project. Beginning in late 2009, TerraSystems was selected to provide GIS services for this leading-edge nationwide project.   TSSW is responsible for a variety of complex database design and progressing tasks. It has required extensive coordination with technical staff as the National States Geographic Information Council and the National Telecommunications Information Administration to refine the initial NSGIC geodatabase model to be compatible with Congressional requirements for the submittal of broadband information.   TSSW has developed, tested, refined and documented a very detailed workflow to process data coming from scores of different broadband providers into a standardized series of tables and geodatabase feature classes. This workflow includes procedures to track and document data processing steps. TSSW continues to develop various data validation (internal) and verification (external) processes to provide feedback to data providers and ensure the data submitted to the Federal Government is as accurate as possible. We have documented our work in a series of working papers, checklists and programs to ensure repeatability when the State takes over the maintenance of the broadband database. The database design, tracking mechanism, documentation and related analyses TSSW developed have recently been acknowledged by the Geospatial Information Officer (GIO) of the Federal Communications Commission as an important contribution to the development and maintenance of the National Broadband Map.

Arizona State Land Department, Conceptual Land Use Planning. Over the past nine years, Mr. Ward and TerraSystems have provided GIS data conversion and technical analysis for numerous Arizona State Land Department Conceptual Land Use Conceptual projects.   As a sub-consultant to Community By Design and The WLB Group, Mr. Ward has researched, collected, processed, analyzed, mapped and documented GIS data sets for ASLD projects in the Arroyo Grande, Eloy, Coolidge, Stanfield, Peoria, Prescott, Lake Havasu, Marana, and greater Tucson areas.

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Central Arizona Association of Governments, GIS Support Services. Over the past three years, Mr. Ward has provided GIS management and on-call GIS support for CAAG. Work includes the creation of a job and population build out model, creation of numerous data processing and analysis utility applications, and production of an updated Pinal County land use layer and Census 2000 geography re-aligned to GIS roads, parcels and imagery. Mr. Ward also provides database design and conversion assistance to CAAG staff for each of the dozen or so socio-economic database CAAG maintains and technical guidance for annual aerial imagery acquisition through commercial providers. Through this project, Mr. Ward has established numerous data contacts throughout the State and Pinal County.

Maricopa Association of Governments - GIS Database Enhancement Project. From early 2000 through 2003, Mr. Ward provided administrative oversight and technical assistance to the Maricopa Association of Governments GIS Database Enhancement Project, a large scale GIS data conversion and automation project that culminated in the creation of a new street network file and a number of socio-economic and land use datasets for Maricopa County. TSSW coordinated the work of four independent subcontractors to MAG, including project scheduling and quality assurance of deliverables. TSSW also performed a street network update for MAG on a separate contract to bring the 2000 work current to 2003 using aerial imagery.

Global Climate Change Program, Prescott College – Spatial Growth Model. Mr. Ward, together with the Global Climate Change Program at Prescott College, designed, developed and implemented the Spatial Growth Model, and interactive application developed to assist communities in predicting future growth patterns by applying "growth rules" determined through public input at interactive participation forums. Mr. Ward as a project team member received the National Partnership for Reinventing Government – Innovative Use of Technology "Hammer Award" from Vice President Gore's office at the annual International ESRI Conference held in San Diego, CA.

Community by Design – Ongoing GIS Support.
TSSW and Mr. Ward have provided Community by Design, a nationally recognized and accomplished planning firm in the area of dynamic urban design and sustainable communities, with GIS services since 2000. From data research and acquisition, to complex spatial analyses and modeling, TSSW routinely provides responsive service with the anticipation and flexibility of a seasoned staff member. Projects includes Taos County, Colorado Growth Management Plan; La Plata County, Colorado Comprehensive Community Plan; Galisto, New Mexico Village Plan; Las Vegas, New Mexico Downtown Action Plan; Los Duranes Sector Development Plan (Albuquerque, New Mexico); Lovington, New Mexico Downtown Master Plan; Sawmill Land Trust/Wells Park Metropolitan Redevelopment Plan (Albuquerque, New Mexico); Silver City Downtown Action Plan (Silver City, New Mexico); Virden Comprehensive Plan (Virden, New Mexico); and numerous Arizona State Land Department (ASLD) Conceptual Plans for the greater Tucson and southern Arizona area.

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GIS EXPERTISE
- ArcGIS 10 / 8.x
- ArcInfo Workstation
- ArcView 10 / 3.x
- ArcGIS Server
- ArcSDE
- ArcWeb Services
- ArcIMS
- Microsoft Virtual Earth
- Google Earth

PROGRAMMING PROFICIENCY
- Geodatabase Design
- ArcObjects
- MapObjects
- AML
- Python
- Avenue
- KML
- HTML / XML
- JavaScript

GIS Software Experience

ArcGIS/ArcInfo. Over twenty years of experience applying ESRI GIS software to complex analysis mapping and interpretation of spatial information.

Python/ModelBuilder. Develop models and scripts for update of existing land use from Assessor parcel information and to assist in the estimation of future electrical demand based on general plan land use. Developing models to estimate future build out in Pinal County and to speed processing of socio-economic databases.

ArcGIS/ArcObjects. Five years of complex ArcObjects experience. Developed numerous ArcObject utility programs for ArcGIS 8 and 9.x in VBA and VB6 development environments. Completed migration for complex Spatial Growth Model from Avenue to ArcObjects using VB and the ArcGIS 9.x environment.

ArcView/Avenue. Seven years of extensive ArcView 3.x experience, including development of complex spatial models and user interfaces. Developed the Spatial Growth Model for NASA/Prescott College. SGM has been used in several states to allocate new growth to vacant land based on a user-defined rule-based framework.

ArcInfo/AML. Ten years of extensive ArcInfo and AML experience, including development of complex data-editing GUI's, data analysis AML's, plot and report production utilities. Programmed all data processing AML's for conversion of AutoCAD parcel drawings to ARC/INFO and then into the first seamless County-wide parcel base shapefile.

GISP

ESRI Technology
AUTHORIZED BUSINESS PARTNER