



The CEDRA Corporation

GIS BASED SOFTWARE and CONSULTING SERVICES

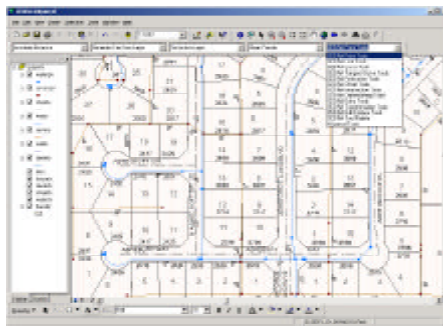
Corporate Overview

The CEDRA Corporation, offers Geographic Information Systems (GIS) based software for mapping, civil engineering design and modeling, surveying and database maintenance applications. CEDRA's AVseries™ suite of software operates directly within Environmental Systems Research Institute (ESRI) GIS software (ArcView® GIS and ArcGIS® 9.x or 10.x), thus eliminating the need to switch back and forth between various software packages. CEDRA software is developed entirely in-house and marketed worldwide to public works agencies, tax assessors, utilities, municipalities and private sector companies.

Complementing CEDRA's Software Development Division is CEDRA's Professional Services Division which has performed consulting projects throughout the U.S. and specializes in developing, populating and maintaining GIS databases, commonly referred to as data capture and maintenance. CEDRA's Professional Services Division offers consulting services for a multitude of applications. These applications can pertain to assisting clients implement CEDRA software or can be totally non-CEDRA software related consulting projects. CEDRA staff is highly proficient in GIS Analysis, Data Capture, Data Conversion, Map Production, Routing and Custom Application Development be it Desktop or Server based

As an authorized ESRI business partner and reseller, CEDRA has a long history in the use and application of ESRI's GIS suite of software. CEDRA has been involved in developing software and implementing solutions based upon ESRI's software since 1987.

CEDRA's GIS based software provides the user: CAD, COGO, Deed Transcription, Parcel Mapping, Surveying, Contouring, Traverse Adjustment, Cross-Section and Profile Stripping/Plotting, Stakeout data, Roadway Design, Earthwork Calculations, Site Development, Plan and Profile Drawing Assembly, Sanitary, Storm, Combined Sewer Modeling, Water Distribution Modeling, Data Editing/Maintenance and DXF export functionality all within ESRI's ArcGIS software environment. This software provides Surveyors, Civil Engineers, Map Producers, Assessors and those involved with Utilities (sewer, water, gas, oil, electric, etc.) a wide range of functionality operating on the ESRI ArcGIS platform.



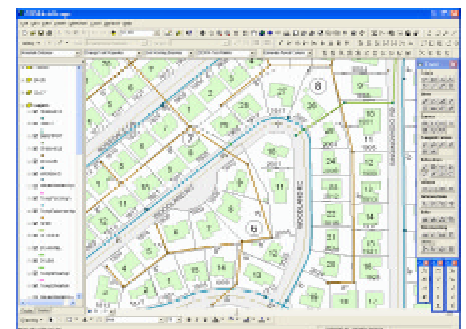
CEDRA's consulting services division, comprised of a number of civil engineers, is highly specialized in developing water, wastewater and storm sewer databases and converting existing information (digital and non-digital) into ESRI's GIS format. CEDRA also has experience in developing databases for other types of utilities such as electrical, oil and natural gas pipeline facilities.

Typical CEDRA conversion projects involve taking surveyed field information in conjunction with design or as-built drawings and developing specific types

of databases, such as street centerlines and rights-of-way, parcels, easements, sewer, water, storm water and other types of utilities. Each of these databases then serve as individual layers which are used to create specific types of maps and digital models. Custom mapping, querying and viewing software is then developed to enable the client to interact with the databases in a desktop or web based environment.

As a privately held corporation CEDRA is able pursue development and services projects that are aligned with its corporate goals and needs of its clients. CEDRA's software development work is primarily oriented towards the surveying, mapping, civil engineering and data management fields. The services which CEDRA offers has been primarily oriented in data capture, data maintenance and custom application development.

During the last few years, however, CEDRA has expanded its scope of services to include routing and network analysis. CEDRA's work with the New York State Energy and Research Agency (NYSERDA) and the Federal Highway Administration (FHWA) has involved developing intelligent 3D GIS based roadway networks which can be used for routing heavy and wide load vehicles as well as fuel efficiency analysis.



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Bridging Engineering and GIS™**

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Asset Collection and Inventory

An example of the types of services that CEDRA provides can be seen in the City of Edmond, Oklahoma (City), the northern neighbor to Oklahoma City. Edmond's population is approximately 81,500, and the utility services involves more than 27,000 water and 36,000 electric accounts.

In 1996, the City began creating a geographic information system (GIS) designed to assist in the mapping of water, wastewater and storm water assets, and in the development of related utility applications. Over the past 19 years, the City's GIS has grown to become an integral part of its daily operations. The City utilizes an ArcGIS enterprise license and is currently implementing several ArcGIS applications. The water, wastewater, and storm water databases of the City were initially created by converting as-built drawings, microfilm and other record information in conjunction with field GPS survey data for the water, wastewater and storm water features. Three dimensional locations of manholes and valves along with invert drop measurements were picked up in the field. The field information, provided by local engineering/surveying firms, was then introduced into the City's GIS by CEDRA utilizing said available record information.

Additionally, the City utilizes CEDRA to maintain the City's parcel and easement layers, which are composed of close to 40,000 parcels and 9,700 easements. All the City's data layers are in Oklahoma state plane coordinates, enabling the city

to overlay other data layers in a common coordinate system. Color aerial photography, which is updated periodically, is used to provide real-life background to the data.

Complementing CEDRA's consulting services, the City has a site license of the CEDRA-AGsuite software, which is composed of the CEDRA-AVcad, CEDRA-AVcogo, CEDRA-AVland, CEDRA-AVparcel, CEDRA-AVsand, CEDRA-AVwater, CEDRA-DataEditor and CEDRA-DxfExport software packages. This software provides the City with CAD, COGO, deed transcription, parcel mapping, surveying, contouring, traverse adjustment, cross-section and profile stripping/plotting, stakeout, roadway design, earthwork calculations, site development, plan and profile drawing assembly, sanitary, storm, combined sewer modeling, water distribution modeling, data editing/maintenance, and DXF export functionality.

The City uses the CEDRA-AVcad and CEDRA-DataEditor software to maintain its electrical data, street centerline, and planning layers. The CEDRA-AVcad software offers a number of geometric tools useful in establishing the geometry of the electric lines and street centerlines. The CEDRA-DataEditor software is a powerful data entry tool used extensively for assigning data to the various features. Using this software, City staff is able to build custom dialog boxes for different

feature classes that enable control of which attributes appear in the dialog box and the order. Single and multi-column dialog boxes can be established with data line fields, as well as drop-down or choice list fields. The CEDRA-DataEditor software is also web-based and has been incorporated into the City's ArcGIS Server urban forestry, project editing, and emergency management applications to name a few.

The City takes advantage of the software's ability to define equations for a feature that generate and save attribute values using the values of other attributes. The use of conditional clauses in the equations provides the city with the ability to generate unique IDs for work orders. The City handles coded domain values so that values displayed in the custom dialog box are actually stored in the database with another corresponding value that is defined by the City.

The City of Edmond began its GIS program in August 1996 with the goal of making it an enterprise GIS. This system now provides extensive information about the City's infrastructure including water, sewer, storm drainage, streets and the electric distribution system. Information from planning, zoning, parks and recreation, and many other departments is included within the GIS, along with data from federal, state, and local agencies

