
Project America

Project America is the Objective of the Southern California Computer Aided Mapping Association. It will illustrate the principals of using a common land base to record various agency AM/FM type information using interactive graphics technology. A one-square-mile area of the city of Covina, located in the Los Angeles basin area of California, will be used as "Typical City, USA," graphically describing all of the infrastructure necessary to provide information for "planning, building safety, public works, public safety (fire and police) and land use."

■ JAMES G. DONAHUE

Geography is the foundation for modern information management. Using the capabilities of interactive graphics to record both graphical and attribute data, we can now provide productive and cost effective information management compared to existing manual methods. Unfortunately, we have no unified approach for the use of geography as we attempt to use computer technology.

In Southern California, for example, tremendous growth is continuing to take place. For instance, the Southern California Gas Company computer mapped approximately 600 square miles in 1986.

A survey by the Southern California Computer Aided Mapping Association (SCCAMA) several years ago in Los Angeles County found that a new subdivision (housing tract) would be mapped over 150 times by varying agencies in the county including gas, water, telephone, electric, city, county, state, and federal. This duplication of mapping is done at tremendous expense to the citizen and detracts from the

intended purpose of using geography for information management. Due to the costs for mapping, practically no individual agency can map an area accurately, that is, using only the recorded data such as bearings and distances and a coordinate system to provide the most accurate land base possible. Agencies must use differing methods, which results in less than desired map accuracy. When composited, these land bases do not overlay each other accurately. The obvious solution has been to develop a "Common Land Base" that has been constructed accurately and would ensure that when overlayed, all infrastructure would be in its correct location. It is also obvious that a land base prepared accurately by the agency and made available to all would cost far less than for each agency to prepare its individual, inaccurate land base.

Project America, then, will illustrate the preparation of an accurate common land base using state-of-the-art mapping techniques. It will also illustrate the ability to use digital data on differing interactive graphic systems. It is hopeful that American interactive graphic system manufacturers will participate in Project America and aid us in removing the stumbling block of

various agencies' having differing systems.

Project America is managed by a volunteer team of AM/FM professionals whose goal is to illustrate the merits of computer technology, the common land base, and the tremendous benefits to be derived from converting our record systems from manual to state-of-the-art computer technology. Project America will be documented in report format and on videotape and made available for other agencies' use. While Project America will graphically represent the infrastructure of "TYPICAL CITY, USA," our primary objective will be to prepare the standards and specifications for a common land base.

Project America will prepare a cost effective, accurate common land base using state-of-the-art mapping techniques.

A Steering Committee responsible for the development of TYPICAL CITY, USA in graphic, video, and report format, is composed of the SCCAMA officers and the chairpersons of the various committees. The Steering Committee's primary purpose is to develop standards for a Common Land Base for the state of California and to provide data to various utility, municipal, and nonmunicipal agencies both within California and in interested areas of the United States, with the objective of generating interest in creating a national Common Land Base.

There is also an Advisory Board consisting of executive representatives from agencies or organizations that have a common interest in the development of a Common Land Base to be used by varying agencies in the recording of their infrastructure data, which, when interfaced, represents information needed by TYPICAL CITY, USA. The Advisory Board includes members from vendors of interactive graphic systems, conversion companies who use interactive graphic systems, professional societies that are interested in developing standards and specifications for a Common Land Base and/or other standards and specifications, governmental agencies such

James G. Donahue, L.S., is with Engineering Service Corporation, Culver City, California.

as the BLM and USGS, and universities that provide academic criteria to support technology.

Common Land Base

A Common Land Base is that land base information that is common between all agencies and provides a foundation for each to record their infrastructure. A Common Land Base will typically consist of street centerlines, street rights of way, lot lines, and appropriate annotative information. SCCAMA's axiom is "Geography is the Foundation for Modern Information Management."

The development of a Common Land Base begins with:

Accuracy Requirements

The Common Land Base has two separate accuracy requirements: (1) accuracy of data input to the system, and (2) accuracy of map products. Currently, all land base information is entered by each mapping agency in Southern California based on the accuracy each can afford. SCCAMA firmly believes that land base information can be entered once using appropriate control and bearing, and distance data resulting in a "Class A" land base, all at a cost less than each agencies' in the preparation of their nonstandard land base.

A Common Land Base provides a foundation for agencies to record their infrastructure.

This might be accomplished in many ways:

- by an agreement that some agency will develop a particular area and make it available to others in exchange for an area they have developed
- by exchange of land data for utility data for a given area
- by development of land by some agency that is made available to other agencies at a cost far less than it currently costs the agency to prepare their less than accurate land base.

Map Product Accuracy

Monumentation Requirements. Monumentation for TYPICAL CITY, USA is needed to satisfy requirements for aerial photogrammetry, establishing California State Plane Grid Coordinates using the Global Positioning System (GPS), and resource legal documents. Monumentation for Project America was provided by Mr. Rich Josenhans, Common Land Base Chairman, and Mr. Rich Claton of H. M. Scott, a California surveying firm.

Global Positioning System—The GPS system will be an orbiting network of broadcast satellite stations providing 24-hour positioning to all points on Earth. By 1988 or 1989 there may be 18 satellites in place. Currently available are satellites known as Block 1. There were scheduled to be 11 Block 2 satellites in place starting in October of 1986, but due to the Challenger tragedy, they have been postponed.

Project America will use the GPS to establish California State Plane Grid Coordinates at designated control points for the one-square-mile TYPICAL CITY, USA area.

ISTAC, Inc., a leader in GPS technology, will establish grid coordinates using its own proprietary hardware and software.

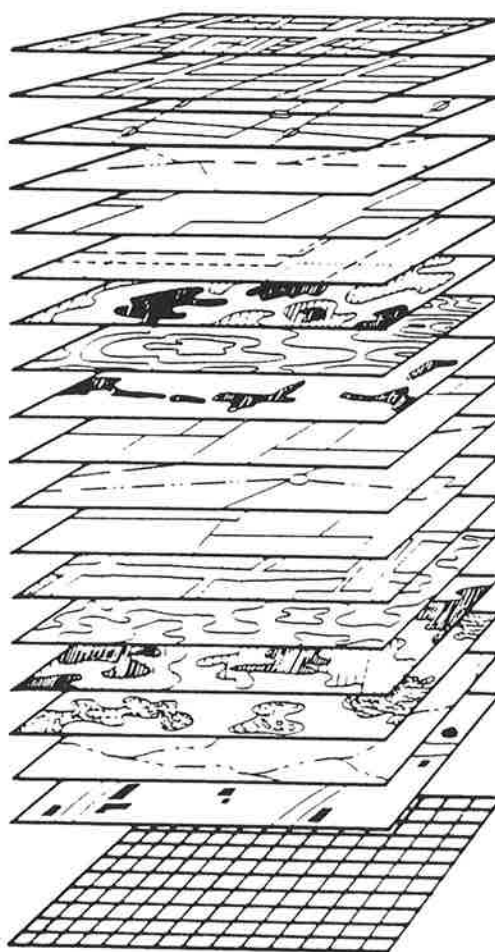
Using ISTAC's Model 2002 receiving system, the following accuracies can be obtained:

- 100-second observations: sub-meter accuracy
- 15-minute observations: 8 cm horizontal, 10 cm vertical, 3 cm length
- 60-minute observations: 5 cm horizontal, 7 cm vertical, 2 cm length.

Aerial Photogrammetry. Airbourne Systems, Inc. of Anaheim, California and American Aerial Surveys of Covina, California for planimetric data capture and orthophotography at 1 inch = 100 feet.

AUTOMATED MAPPING SYSTEM

Facilities Records



Land Parcels
 Transportation Network
 Utilities
 Zoning Districts
 Census Tracts
 Police Dispatching
 Flood Plain Mapping
 Noise Impact
 Seismic Risk
 Fire Zones
 Flight Patterns
 Subsidence
 Neighborhoods
 Soils
 Geology
 Vegetation/Wildlife
 Hydrology
 Historical Archaeological Features

LAND BASE

Representative Data Base

One of the important components of Project America is the building of a representative computer resident data base of information useful to a typical American city. For the first phase of Project America, the original town site (approximately one square mile) of the city of Covina, California was selected as the area for the representative data base. It was decided that for this phase the data base would include graphics data only.

The demonstration data base will include cadastral data, photogrammetrically compiled data, and infrastructure data. The existing electronic data from the Los Angeles County Engineer will be used for the cadastral data. The Photogrammetry Committee will determine which visible features and topography are to be included. The Infrastructure Committee and the

Utilities Infrastructure Sub-Committee are responsible for determining what infrastructure data are to be included and for entering or placing these data in the Covina data base.

The infrastructure for a city is the combination of facilities that provide the foundation for day-to-day living for the citizens of the city. The elements of the infrastructure are not precisely defined, but there is general agreement on what constitute the primary components. For Project America, the following will be included:

- water, sewer, and storm drain facilities
- electric, gas, and telephone facilities
- roads, streets, and railroads
- other facilities as appropriate (e.g., city buildings, schools and hospitals, traffic signs and signals, cable TV).

Responsibilities are divided between the Infrastructure Committee and the Utilities Infrastructure Sub-Committee such that the Infrastructure Committee is responsible for data that would normally be maintained by the city, and the Utilities Infrastructure Sub-Committee is responsible for data that would normally be maintained by other agencies (utility companies, county and state governments, transportation companies, etc.).

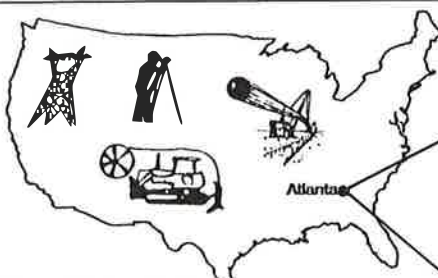
The demonstration infrastructure data base will comprise a combination of data that currently exist in electronic form and data that do not. Data that already exist in electronic form will be translated into the Covina data base. The additional data will be entered using standard data conversion techniques. (IRWA)

ATTEND

IRWA Course 214 Skills of Expert Testimony Preceding the Dearborn Seminar

This popular course will be presented Saturday, June 17, 1989, at the Hyatt Regency, Dearborn. To register, send your check for \$85 to International Headquarters: 9920 La Cienega Blvd., Suite 515, Inglewood, CA 90301, Attn: Reni Moore. Note: Mark your check "Course 214—Dearborn." Questions? Call Headquarters at (213) 649-5323.

Sam H. Thompson
President



"Quality...Service...Results"

SERVING

- Telecommunications Industry
- Pipeline Industry
- Gas and Electric Utilities
- Governmental Agencies
- D.O.T.'s
- Municipalities
- Fortune 500 References

FULL SERVICE

- Design
- Surveying
- Engineering
- Mapping
- Inspection
- Right-of-Way & Aux. Stations
- Condemnations
- CAD System

Ralph H. Maxwell
Executive Vice President

**AMERICAN
ENERGY
SERVICES
INC.**

AMERICAN ENERGY SERVICES, INC.
8215 Roswell Road, Bldg. 800
Atlanta, Georgia 30050
(404) 399-9300 FAX (404) 399-7838