

A GEOWEB BUILDING PERMIT APPLICATION BUILT WITH OPEN TECHNOLOGY AND PARTICIPATORY APPROACH

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BoCC Alachua County, Florida – October 2008

introduction – *Alachua County profile (Census 2000)*

- **General**

- Population – 217, 995
- Area - 916 sq miles
- Nr of local governments – 10

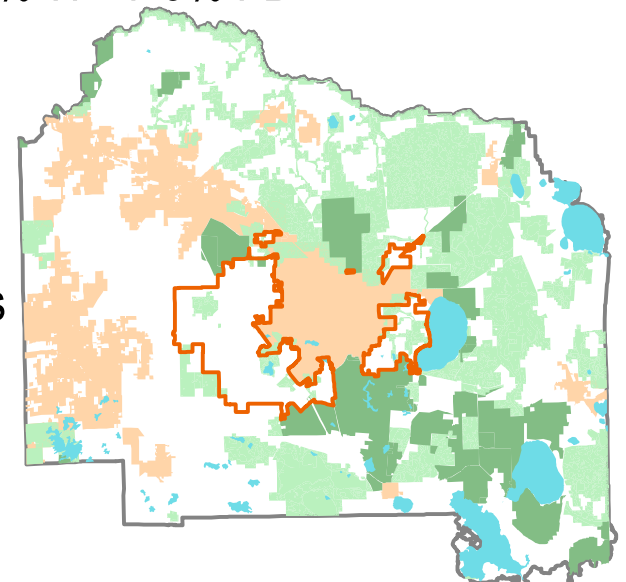
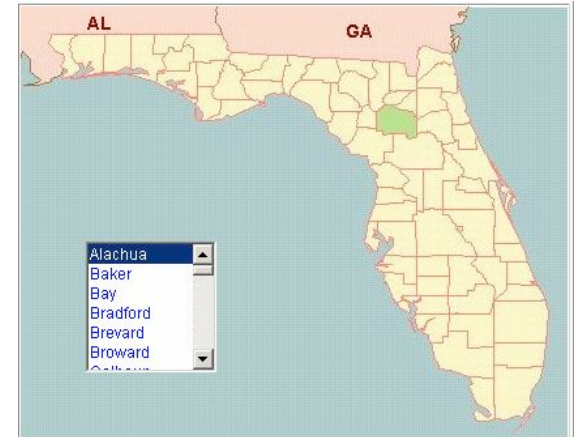
- **University of Florida** – 50,000 students

- **Socio Demographic**

- Human classifications 3.5% A - 19.3% B - 5.7% L - 73.5% W - 7.3% FB
- Housing – owned 54%, rented 45%
- Education – 88% HS, 39% Bach, 19% Grad
- Poverty – 22% individuals

- **BoCC Landuse** – progressive planning techniques/programs

- 10 % residential, industrial, institutional, commercial, etc
- 14 % in preservation
- 76 % in agriculture / 26% strategic ecosystems



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background – *building activities in Florida*

- Per Florida Statutes, as of 2002, Building Construction Standards are based on a single statewide Building Code.
- This code can only be amended/updated by the Florida Building Commission.
- This code supersedes all local codes and it is enforced by local governments.
- The Building Official and all building staff are state certified and are not responsible professionally to the local powers.
- There are 63 counties and 403 local governments in Florida.
- Alachua County operates under this framework.
- Building activities average at 400 per month with 100 inspections per day.

background – *technology infrastructure*

- web infrastructure
 - MySQL, PHP, html, MapServer, ArcIMS
- GIS infrastructure
 - ESRI desktops and extensions
- RDBMS infrastructure
 - Oracle
 - ArcSDE
- custom applications – 13/14
 - almost all GeoWeb
 - all built in house with open technologies

background - *existing culture*

- Unconventional ways of planning, budgeting, and implementing
- Exclusive *in-house* work from conception, development to maintenance
- Use of FOSS products in combination with commercial products
- Partnerships with academic institutions and educational institutions
- Non conventional initiatives in inter-governmental cooperation and resource sharing
- 13 – 14 custom applications, developed in-house with a TCO close to 0

problem – *legacy system*

- **A proprietary desktop front end and database**
- Obsolete technology and deployment model, 4 modules
- 7 years in use as a windows version (*DOS before*)
- 35-40 license seats, intense daily use
- 7 departments located disparately
- Extremely poorly designed and built – never accepted by its users
- No help file, no documentation of any kind
- No standard security, no standard administration interfaces
- Constant system errors, no standardization of data input, etc.
- Very poor management from proprietor, minimal response
- Extremely disadvantageous contracts and agreements for us
- TCO – 900k (*upfront cost, yearly support, 1FTE dedicated administrator*)

problem – *legacy system*

- very high overhead cost (~100,000 USD/year)
- operational limitations
 - office bound for users
 - couldn't work well outside of one building
- no integration with GIS
- no ready public access
- very cumbersome reporting – Crystal Reports/Excel (*separate licenses*)

primary objective

Migrate out of a desktop legacy system into a broader GeoWeb application without interrupting daily operations.

specific objectives

- Utilize existing infrastructures of software, hardware, databases, etc.
- Ensure normal continuation of daily operations while gradually transition from legacy system into the new.
- Convert and integrate with our GIS system all of the information on land administration activities collected over the last 25 years in Alachua County.
- Make all information available in real time to the public and to county departments by conventional ways and by location.
- Avoid formal ways of bureaucratic operations.

method – *participatory design approach*

- Building clerks
- Building inspectors
- Code inspectors
- Alachua County Building Official
- North Central Florida Builders Association
- All actively involved from conception till final implementation

method – *overall cycle*

- No structure, no plan – play by intuition
- Get users input – read Florida's Building Code
- Get users input – identify user group roles and activities
- Redesign work flows – reverse engineer and create use cases
- Get users input - refine
- Join tests with users, refine again, test again

Reverse engineering

- Data Model
 - Tables, Relationships, Field Values
- Business Logic
 - Triggers, Default Values, Special Cases
- User Interface
 - Security Levels, Data Formatting

Open Standards and Interface

- All tools accessible by any modern web browser
 - Written using W3C web standards (XHTML and CSS)
- Data available in a variety of formats
 - HTML, PDF, CSV, TXT

Technological Agility

- Separate layers of implementation
 - Data
 - Business Logic
 - Presentation/Interface
- Each can be upgraded/migrated independently
- Freedom of choice in each implementation, no vendor lock in

Closed Software Stack

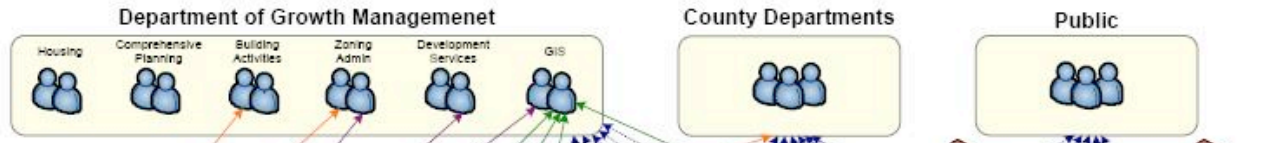
- Client
 - User Interface (Compiled EXE)
 - Operating System (Windows Only)
- Server
 - Application Code (C++, Closed Source Code)
 - Database (Oracle Only)

Open Software Stack

- Client
 - User Interface (IE, Firefox, Safari, Opera)
 - Operating System (Win, Mac, Linux)
- Server
 - Application Code (PHP, Java, Ruby on Rails)
 - Mapping Interface (ArcIMS, GeoServer)
 - Web Server (IIS, Apache)
 - Database (Oracle, MySQL, PostGreSQL)

SYSTEM ARCHITECTURE – GROWTH MANAGEMENT

USERS



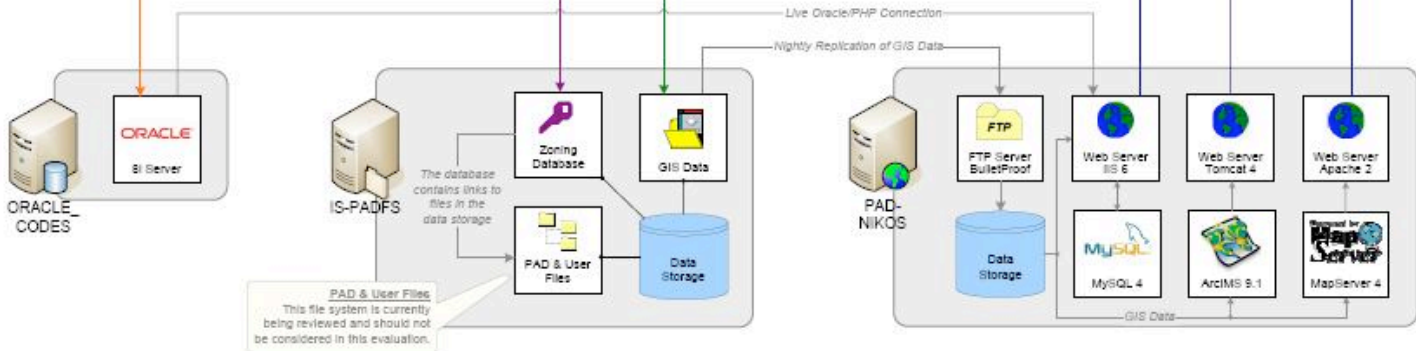
APPLICATIONS



Alachua County Firewall
All users outside of the County Intranet must connect through the County Firewall.



SERVERS



PAD & User Files
This file system is currently being reviewed and should not be considered in this evaluation.

Method - *resources*

- Existing Infrastructure of Hardware, Software, Data Bases
- Staff resources - 3 FTEs in between their daily chores
- Main ingredient?
- A missionary or a strong belief system driven determined approach, which generated a truly unique chemistry

results ?

- Did we meet objectives?
- Did we stumble into un-anticipated results?
 - good/bad?
- Quantitative?
- Qualitative?

A WEBGIS BUILDING PERMIT TRACKER --- BUILT WITH AN OPEN TECHNOLOGY AND A PARTICIPATORY APPROACH

Alachua County Department of Growth Management GIS Division, Gainesville, Florida



Report Maker - 25 types

Permits, Inspections, Certificates of Occupancy, and all the wealth of the information on building activities that resides in our internal system, are made accessible to anyone via this component. Twenty-five types of reports have been designed based on the needs of the public, the county staff, and the Florida Building Code. Users can generate yearly or monthly statistics for each of the last 27 years for each of these 25 report types. Reports are available as a Web Page, a PDF file, an Excel spreadsheet, and as customizable Map Products. Map Product reports include an Image Map customized by the user and its corresponding tabular information in Excel and Text/CSV format. All reports are generated from live information. This means that for the current month one can generate progressive weekly, daily, or hourly reports.

Daily Monitoring of Inspection Progress



This component has mostly been designed for the Building Official and the Assisting Building Official who can monitor in real time daily progress and location for each of their inspectors from the Internet. As the inspectors process inspections around the county and enter results via the web interface into the system, the list of the morning dispatch as assigned to each inspector, shrinks gradually, for each completed inspection, till at the end of the day it becomes zero. This is also a list that anyone from the public can follow, if and when it relates to their own property.

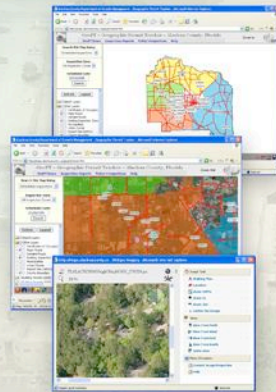


Morning Assignment and Dispatch of Work Orders

This component provides for a variety of ways for the Inspection Work Orders to be plotted out and then divided among the inspectors. All is open to the public as well. Dispatching and Work Orders can be generated by zone, by day, by area.

Geographic Permit Tracker (GeoPT)

Anyone from the public or the county organization can use this component to map out permits that have been issued in Alachua County from 1982 till present. Permits can be mapped year by year or altogether, and can be searched by parcel number, owner, address, etc. All corresponding tabular information to these mapped permits can be accessed or can be downloaded as an Excel or CSV/Text file. Aerial photographs, oblique imagery, and several other layers of information can be overlaid to the permits. From this component one can search by inspection date or inspection zone and then map out locations of inspections which were scheduled for that date, either by phone or online the previous day. In addition, two types of reports with maps embedded in them can be automatically generated from this mapper each day. These reports are used each morning by the inspectors and the Building Official as work orders to dispatch and assign daily workload for the Building Division.



Scheduling of Public Inspections



Everyone from the public or the county employees can schedule an inspection online for a building permit that has been issued. The public can log in using their building permit number as a unique identifier and the county employees can use their own log in. Ever since we have implemented this feature, the number of inspections scheduled by phone has dropped by 25%.

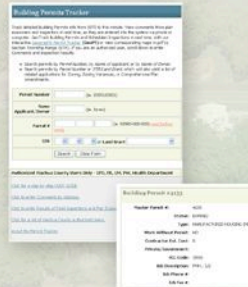


Field Data Entry

County employees from several county departments, such as environmental inspectors, fire inspectors, health inspectors, plans examiners, arborists, building inspectors, demolition officers, or front counter clerks, can also enter comments and results into the system with a login, via the web interface. These comments and results are automatically displayed live on the web for everyone else to view.

Building Permit Tracker

With this module, anyone can track detailed Building Permits info from 1979 up to the minute. Anyone can view comments from plan examiners and inspectors in real time, as they are entered into the system via phone or computer. These permits are also tied to corresponding maps in pdf organized by Section Township Range (STR). Searches can be done by Permit Number, by Name of Applicant, or by Name of Owner. Searches can also be done by Parcel Number or STR/Land Grant, to yield a list of all related applications for Zoning, Zoning Variances, or Comprehensive Plan Amendments.



Help Files and User Guides



The tracker provides step by step user guides and help files for both the general public and the county's employees, for each of its functions and features. These user guides are very detailed and are embellished with images and examples easy to follow.



results – *from the trenches*

- our internal users at start
 - paper culture, no individual PCs available
 - zero to none digital culture
 - field people with an average range 40-60
- our internal users now
 - laptops and printers on trucks
 - entirely remote work
 - remote dispatch and real time field monitor
 - adoration for the system
 - sense of ownership and genuine sense of pride in it



results – *by overall users*

- 900 – 1,000 transactions per day, lower on weekends
- users from six departments for data entry
- users from long range and strategic planning in organization
- users from executive levels
- users from the building / developers community
- home owners / builders
- users from the business community at large
- users from the public, advocacy groups, etc.
- research and non profit community

results – *by cost*

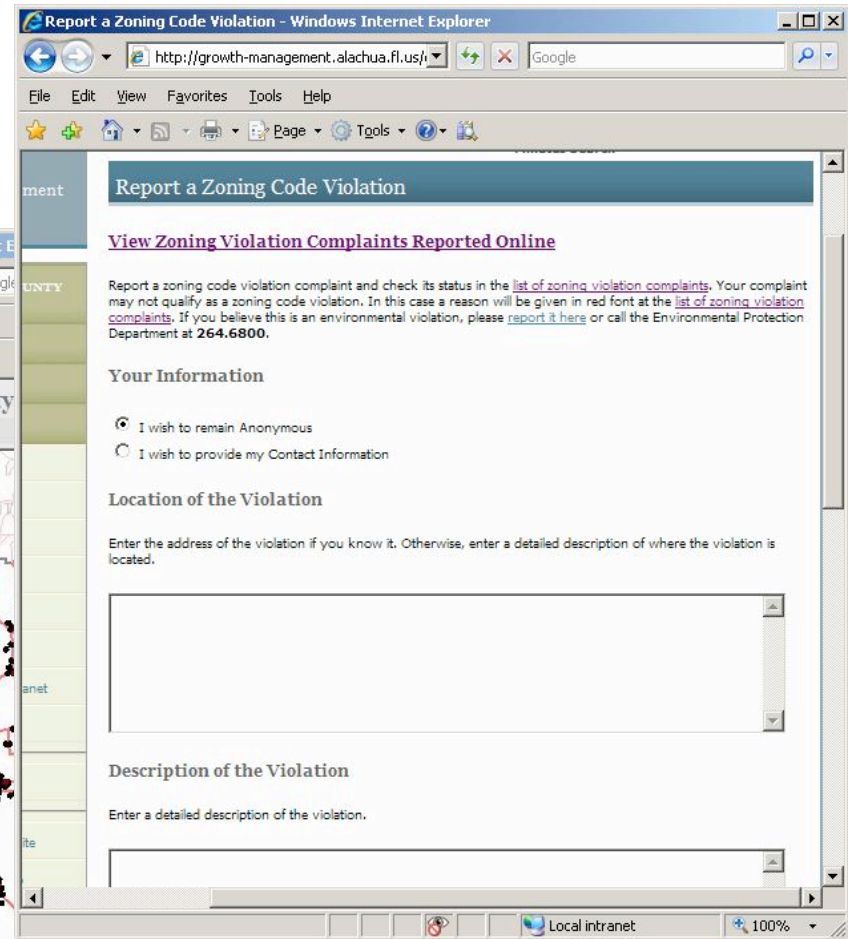
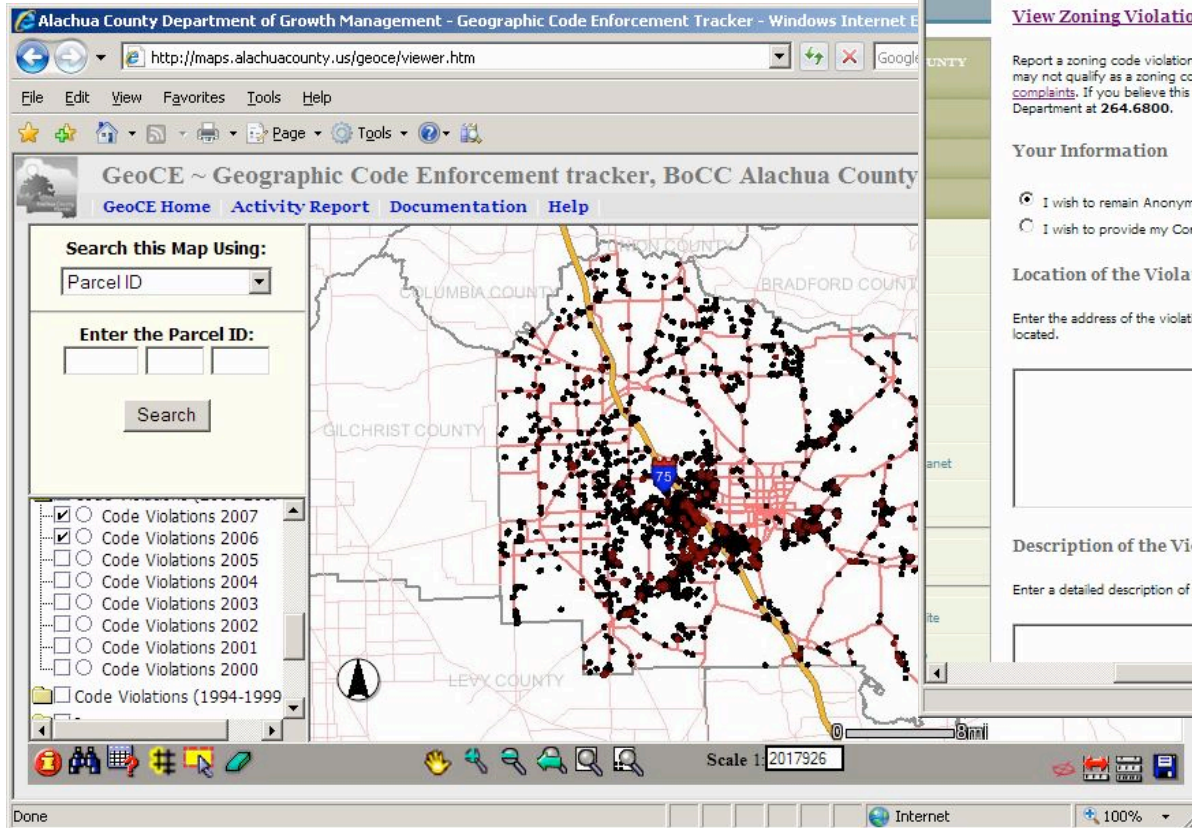
- conservative cost estimate saved from not buying a commercial product
 - 500,000 USD – upfront cost
 - 50,000 USD – yearly maintenance
 - and...in 50% of cases they are not accepted by the users
- by volume of freed organizational resources
1.5 FTE inspector ~ 85,000 USD per year
- by stopping maintenance payment previously paid to proprietary vendor
15,000 USD per year
- by making obsolete an automatic inspections phone system
12,000 USD per year

results - *else*

- not measured operational gains from
 - public access
 - work flow process redesign
- cultural
- by value created for future re-utilization
- by making a proper infrastructure investment
 - enabling new accomplishments
 - Code Enforcement tracker
 - Impact Fees calculator
 - Green Mapping system

results – by enabling new accomplishments

Code Enforcement Tracker



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results – by enabling new accomplishments

Impact Fees Calculator

Application Date: July 28, 2008 10:43 am

Impact Fee District Number: District 1

Number of Units:

Square Feet of Residential Heated Area:

Gross Square Feet of Non-Residential Floor Area:

Check box if property is inside Urban Cluster:

If any of the following are true, please check for assistance

Change in Land Use Category:

Shell Permit:

Credit Requested:

Category Review Requested:

Individual Fee Application:

Parks and Recreation Impact Fee (Residential):

Heated Area (SF):

Park and Recreation Impact Fee:

Park and Recreation Credits Applied:

Net Park and Recreation Impact Fees:

Contractor: Mr. Test

Permit Type: ACCESSORY BUILDING

Job Address: test place

THIS FORM IS PRESENTED AT THE TIME OF APPLICATION FOR A BUILDING PERMIT AND MUST BE CLAIMED PRIOR TO APPLICATION FOR A BUILDING PERMIT. OTHERWISE, THIS CALCULATION MADE SHALL BE DEEMED WAIVED.

results – by enabling new accomplishments

GeoGreen Mapper

The screenshot displays the GeoGreen Mapper web application interface. The main window shows a map of Alachua County, Florida, with various green building and environmental data points overlaid. The interface includes a search bar, a legend, and navigation tabs. The legend on the left side of the map is titled "Search this Map Using:" and lists various categories and sub-categories with checkboxes. The categories include Conservation/Recreation, Cultural/Preservation, and Green Buildings (Draft). The Green Buildings (Draft) category is expanded, showing sub-categories like Solar Panel Permits, Libraries, Bookstores, Farmer Markets, Plant Nurseries, Community Gardens, Cultural Centers, Recycle/Reuse Centers, Historic Markers, Historic Structures, and Natural Food Stores. The map shows a dense network of green buildings and other environmental features across the county. The interface also includes a navigation menu at the top with links to Home, Green Buildings, Bicycle MasterPlan, Recreation MasterPlan, Waterways MasterPlan, Land Conservation, CLIP Report, and Help. The bottom of the window shows the Windows taskbar with the time 1:22 PM and the date Saturday.

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next?

- Replacement of the last remaining module and therefore terminating the legacy without interrupting operations (*remaining users 7-8*).
- Re-architecture the entire web based spatial infrastructure to adjust to the recent massive advancements precipitated by the Google opportunities. Already working with TOPP on this.
- Re-evaluate and decide on need for replacement of current commercial RDBMSs with Open.
- Transplant this model across other Florida communities? How to?

afterthoughts - in lieu of discussion

- Did we have any upper level direction? request?
- Has it proven as the best solution?
- Have we been understood? accepted?
- Rewarded?
- Are there downsides? Risks to this method?
- Reuse in other Florida governments? How realistic?
- What does this all mean? Is the effort worth in a Local Government context?

words of wisdom

There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things.

Niccolò Machiavelli, 1514, The Prince.