GIS Driven N11 System: LA County 2-1-1 & Bay Area 5-1-1

The purpose of the paper is to discuss the role of GIS in N11 systems. In order to describe GIS involvement we will be using two live examples of N11 systems: County of Los Angeles 211 system and Bay Area 511 system. N11 systems involve two user interfaces: web interface and phone system. In this paper only N11 web interface will be discussed, phone system is out of scope.

The paper content is divided into four sections:

- Introduction to N11 systems
- County of Los Angeles – 211 system
    - 2-1-1 Inception
    - County of Los Angeles 2-1-1 Implementation
    - GIS role – key system elements
- Bay Area – 511 Transit system
    - 5-1-1 Inception
    - Bay Area 5-1-1 Transit System Implementation
    - GIS role – key system elements
- Conclusion

Introduction – N11 systems

N11 is a three digit telephone number, like 911, 511, that the public could call for help in emergency and non-emergency situations. Public can interact with N11 system either using telephone system or web system. Nationwide deployment of N11 system has leveraged both form of communication web and telephone system.
Today, web system has become an integral part of our society. In North America 67.4% of the population uses internet (Source: http://www.internetworldstats.com).

Please find below list of N11 systems being used nationwide.

N11 Systems	Purpose	N11 Systems	Purpose
2-1-1	Connects callers to information about critical health and human services available in their community.	7-1-1	711 system is to communicate with deaf, hard-of-hearing or speech-disabled people who use text telephones, also known as TTY devices.
3-1-1	City's phone number for government information and non-emergency services.	9-1-1	Emergency service number

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5-1-1	America's new, easy-to-remember travel information telephone number.		

County of Los Angeles – 211 System

2-1-1 Inception

The national 211 collaborative, a coalition of non-profit organization and public/private partnerships, petitioned the FCC on May 28, 1998 to assign 211 for public access to community information and referral services across the U.S. With one easily remembered number, people in need of vital services – like food and shelter, home health care, and child abuse intervention could be referred to the right local service agency without struggling through hundreds of telephone listings and making many frustrating calls.

Since 1981 INFO LINE of Los Angeles a non-profit organization has been providing information and referring over 380,000 individuals and families.

California Public Utilities

Commission on October 16, 2003 granted the application of INFO LINE of Los Angeles to be the 2-1-1 provider of Los Angeles County. On July 1, 2005 the 211 phone number will offer residents in County of Los Angeles referral to agencies that help with various needs.
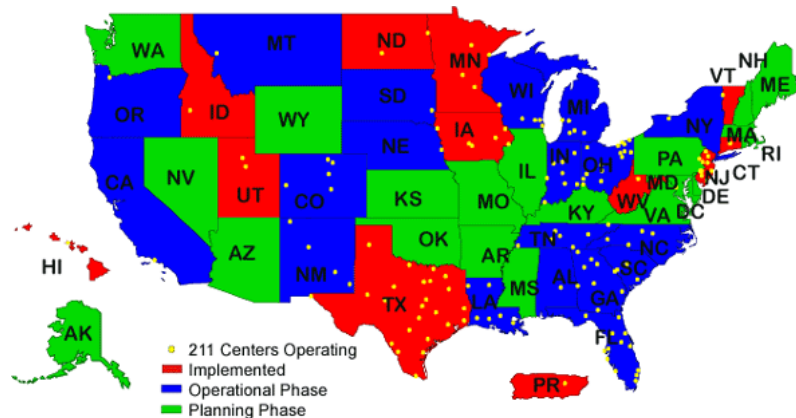
County of Los Angeles 2-1-1 Implementation

The 2-1-1 California Partnership is a collaborative effort between the California Alliance of Information and Referral Systems (CAIRS) and United Ways of California (UWCA) to implement 2-1-1 service throughout the state.

In Los Angeles County, the funding comes primarily from the Department of Social Services, with contributions from United Way.

The data center for Los Angeles County 2-1-1 system is INFO LINE's comprehensive database. Comprehensive database consist of 4100 public and private

organization providing about 27,000 social services program using Taxonomy of Human Services. County of Los Angeles plans to utilize this database through two interfaces: call operator interface and public web interface. Department of Health and Human Service (along with bd Systems, Inc) are developing a web interface to help public to locate health service using various search criteria's.

This website is developed using ArcIMS (ASP, ActiveX connector) and SQL Server ArcSDE. Site allows user to start with three kind of search: Search for Service, Search for Neighborhood and Search by Name.

Based on the search criteria specified by the user, the system generates a results page displaying selected services on the map and listing services in tabular form. Tabular form also gives user the option to get detailed information about the service i.e., address, contact information, working hours. For each of the service selected, user can also get driving direction and public transportation itinerary.
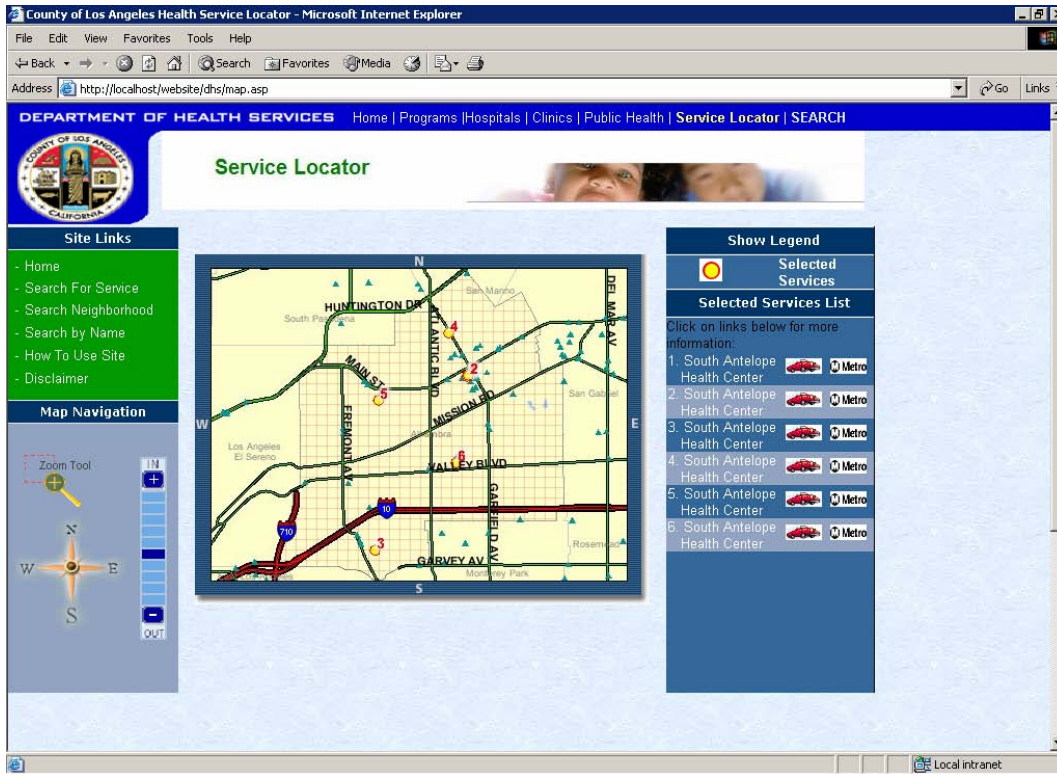
GIS Role – Key GIS Elements

County of Los Angeles Health Service Locator can be labeled as menu driven and semi-map centric application. The key GIS elements being using in this applications are:

1) Address geocoding using ArcSDE Java API
2) Map Display using ArcIMS and ArcSDE
3) Map Navigation
4) Spatial Searche to find nearest services
5) Driving direction using RouteMap IMS
6) Itinerary generation using Transtar

Bay Area – 511 Transit System

5-1-1 Inception
In July 2000 the Federal Communications Commission (FCC) designated 511 as the national travel information number. The first 511 service was launched less than a year later in Northern Kentucky, and by early 2005 twenty-five 511 systems had launched with several more on the cusp of launching.

Bay Area - 511 (http://www.511.org) is a free phone and Web service that consolidates Bay Area transportation information into a one-stop resource. 511 provides up-to-the-minute information on traffic conditions, incidents and driving times, schedule, route and fare information for the Bay Area's public transportation services, instant carpool and vanpool referrals, bicycling information and more. It is available 24 hours a day, 7 days a week.

Bay Area – 5-1-1 Transit System Implementation

The 5-1-1 Bay Area system is managed by a partnership of public agencies led by Metropolitan Transportation Commission (MTC), by California Highway Patrol, and the California Department of Transportation. The 511 covers entire nine counties in Bay Area.

Bay Area Transit 5-1-1 plays a key role in Bay Area 5-1-1 system. It is accessible by phone and web-interface. The on-line version of the transit information service features the [511 TakeTransit Trip Planner](#). This automated Web-based tool assists in planning Bay Area transit trips. By typing in the starting and ending points, the Trip Planner will return the most efficient routes, including walking maps to and from transit. The [Popular Destinations](#) feature offers information on how to travel to famous or familiar Bay Area sites using transit. Other features include transit schedules and route maps, fare information and Para transit information for the elderly and disabled.
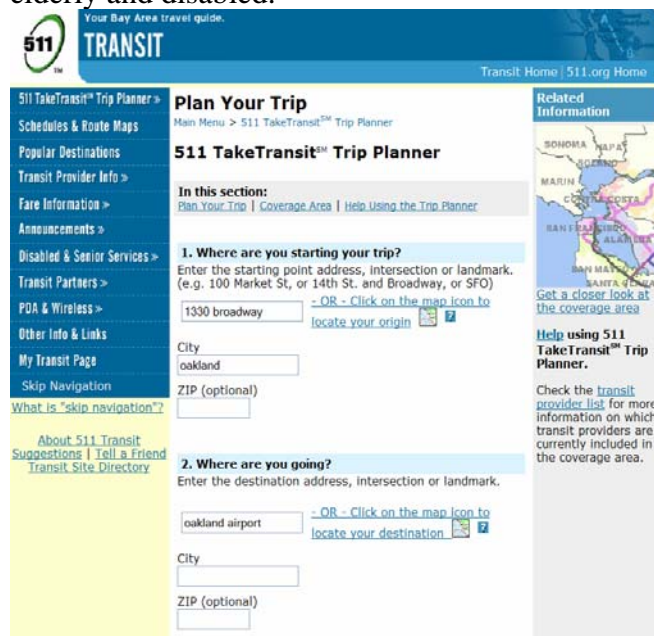
The Transit 511 portal allows user to do trip planning, view schedules and route maps, view popular destinations, get specific transit provider information, fare information, agency announcements, downloading information onto PDA and Wireless (In progress).

The Transit 511 integrates transit information from ~26 different Bay Area transit agencies. The transit information includes stop

Information, routes, patterns and schedules. The key challenge is to consolidate these data from different source and different formats into a single database. The database is populated using XML. This system includes it own proprietary database schema

(Regional Transit Database (RTD)) to store transit information. MTC also has its proprietary XML schema that is used to update RTD.

There are suites of data maintenance application (Data Maintenance Suites (DMS)) that are utilized to add and edit information gathered by different transit agencies.

Data maintenance applications allows data administrator to update stops locations and attribute information, patterns, landmarks, fares, schedules and geometries. These applications are all GIS driven using ArcObjects.

Transit agencies are also provided with content management system to update agency profile, add/delete announcements, access user feedback and generate reports. Transit agencies business protocol is followed to update information on Content Management System.
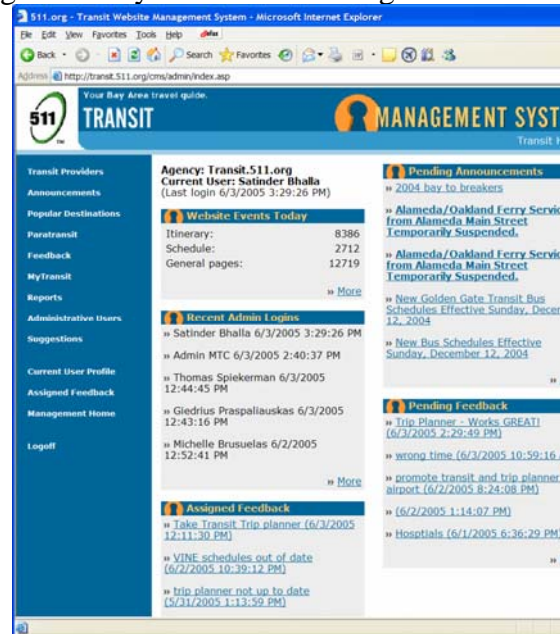
GIS Role – Key GIS Elements

Bay Area 511 System can be considered as non-map centric application. The key GIS elements being using in this applications are:

1) Address geocoding using ArcSDE Java API
2) Map Display using ArcIMS and ArcSDE
3) Map Navigation
4) Itinerary generation using Transtar
5) Data Maintenance applications using ArcGIS and ArcObjects

Conclusion

N11 system has become one of the important public information system over the past few years. Total number of users using this system is increasing multi-fold every year. Itself Bay area 511 Transit web system gets 100,000 hits and generates 30,000 maps each day.

N11 system has vast usage of GIS. It does not only help in displaying spatial information but also analyzing and querying information.

GIS is no more a tool, it is a technology that has multiple applications. It is not restricted to any one domain market but is being used by various sectors as Transportation, Utility,

Health, Finance, Defense, Agriculture, Public Safety and Telecommunications. GIS is has become analytical and visualization technology.