

Orange County Transportation Authorities Web Based GIS Project Submittal Application

Jim Sterling

Orange County Transportation Authority

GIS Section Manager

&

Tobias Wolf

AMEC Earth & Environmental

GIS Group Manager

2005 ESRI International User Conference

July 25–29, 2005

ESRI Abstract

This case study will review the methodology and technology that Orange County Transportation Authority (OCTA) used to improve their Combined Transportation Funding Programs (CTFP) *Call for Projects* initiative.

A Call for Projects occurs biennially to all eligible local agencies within Orange County and encompasses Measure M streets and roads competitive programs. CTFP was created to provide local agencies with a common set of guidelines and project selection criteria for a variety of funding programs.

To improve efficiencies in this process, OCTA decided to create a web-based version of the CTFP that would allow end-users to submit application information and delineate project boundaries from their desktop web browser.

The new CTFP system involved the development and implementation of a re-engineered database, a Web-based user interface for entering and maintaining Project information, and an integrated Internet Map System to support application submittals. The new system also permits improved project review, ranking, and administration by OCTA staff.

Project Overview

A Call for Projects occurs biennially to all eligible local agencies within Orange County. The CTFP encompasses Measure M streets and roads competitive programs, as well as federal sources such as the Regional Surface Transportation Program (RSTP). CTFP was created to provide local agencies with a common set of guidelines and project selection criteria for a variety of funding programs. During the 2004 Call for projects, 35 local jurisdictions within Orange County were invited to submit one or more transportation project applications to OCTA. In general, applications fall within one of several funding programs with each program having unique requirements and scoring criteria used for ranking and approval of the submitted applications. The 2004 CTFP will provide \$248 million of funding for street and road improvement projects over the next five years.

Prior to the 2004 Call for Projects, OCTA used a forms-based Access database to collect, review and rank project applications. The Access database was sent to each of the 35 local jurisdictions for application submission and then returned to OCTA for consolidation, review, ranking and approval. To improve efficiencies in this process, OCTA decided to create a web-based version of the CTFP that would allow end-users to submit application information and delineate project boundaries from their desktop web browser.

The new CTFP system involved the development and implementation of a re-engineered database, a Web-based user interface for entering and maintaining Project information, and an integrated Internet Map System to support application submittals. The new system also permits improved project review, ranking, and administration by OCTA staff, as well as the generation of reports for monitoring and managing the program.

The presentation will cover the following technology used to create the new CTFP web based application:

- SQL database design
- Web design with ASP programming
- Customized ArcIMS interface allowing end-user project boundary input



CTFP Overview

- **Combined Transportation Funding Program**
 - Encompasses Measure M streets and roads competitive programs, as well as federal sources
 - Provides common set of guidelines and project selection criteria to jurisdictions
 - Each program has unique requirements and scoring criteria used for ranking and approval
 - 2004 CTFP will provide \$248 million of funding over the next five years



Funding Programs in 2004 Call for Projects

- Regional Interchange Program (RIP)
- Intersection Improvement Program (IIP)
- Signal Improvement Program (SIP)
- Transportation Demand Management (TDM)
- Master Plan of Arterial Highways (MPAH)
- Growth Management Area (GMA)
- Arterial Highway Rehabilitation Program (AHRP)
- Grade Separation Projects
- Grade Crossing Safety Enhancements





Overall CTFP Process

1. Call for projects
2. Entry and submittal of Applications for funding
3. Scoring, review, and evaluation of Applications
4. Ranking and approval of Applications for funding, and allocation of funding
5. Periodic monitoring and updating of Funded Applications, including payment processing



Previous CTFP System

- **System Details**
 - Developed in the early 90's
 - MS Access forms based application
 - Multiple databases including MS Excel
 - Multiple copies of database for each jurisdiction
- **Process Steps not well integrated**
- **Reporting was a challenge to manage**
- **No geographic component**
- **No connection to other programs**



Re-Engineering Process

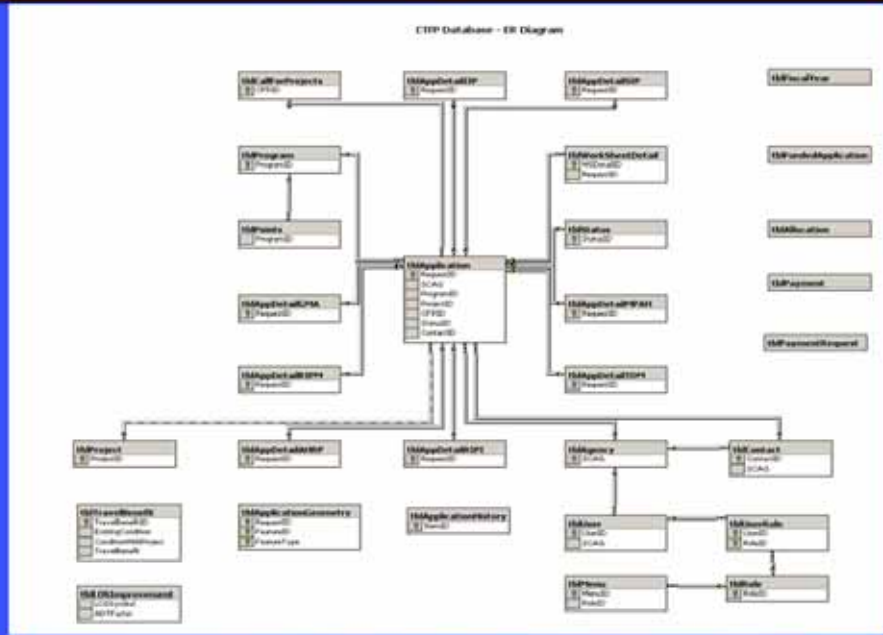
- **Rational Unified Process**
 - Functional Requirements Definition
 - System Design Document
 - System Development
 - System Testing and Deployment
 - System Documentation & Training

Technology

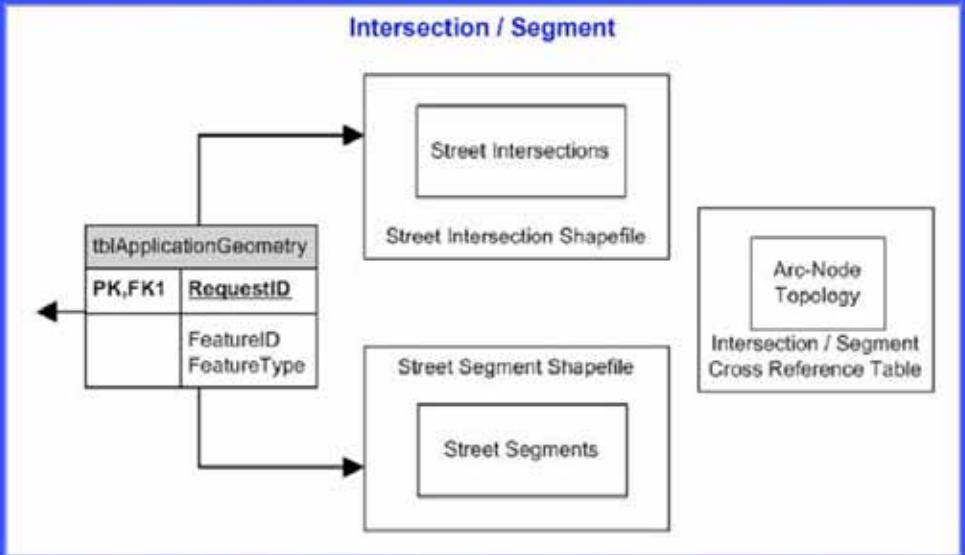
- **Software**
 - MS SQL Server 2000 SP3
 - SQL user client access licenses (CALs)
 - Microsoft IIS 5.0
 - ESRI ArcIMS 4.0.1
 - Apache Tomcat, Java Development Kit
 - ASP web programming
 - RoboHelp Help Files
- **Hardware**
 - Compaq ProLiant DL360 G3
 - Intel Xeon 2 x 3.2GHz/1MB (dual CPU)
 - 2 GB's Ram



CTFP Database Schema

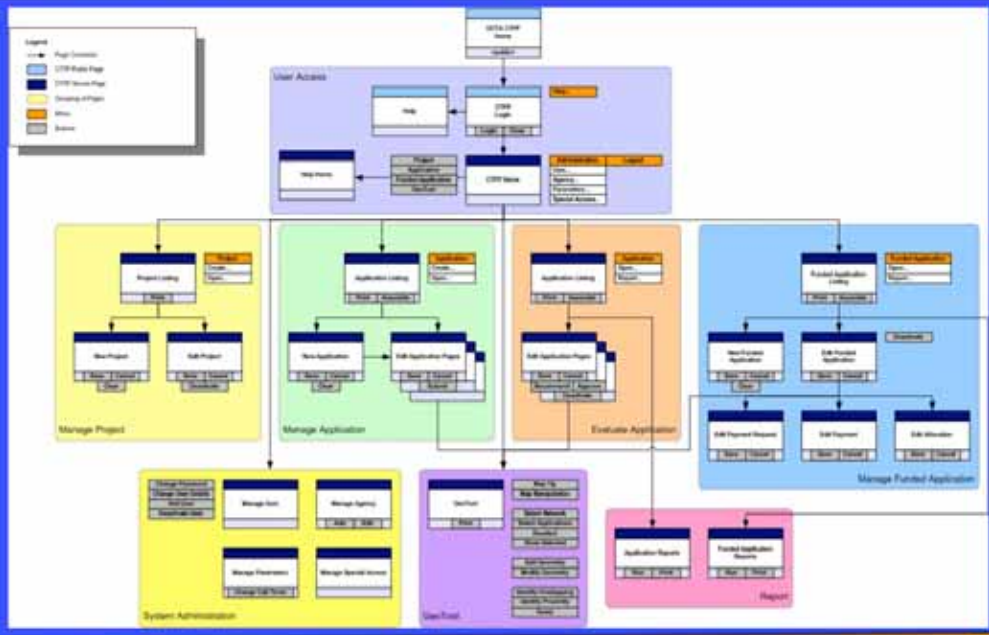


Logical Spatial Data Model

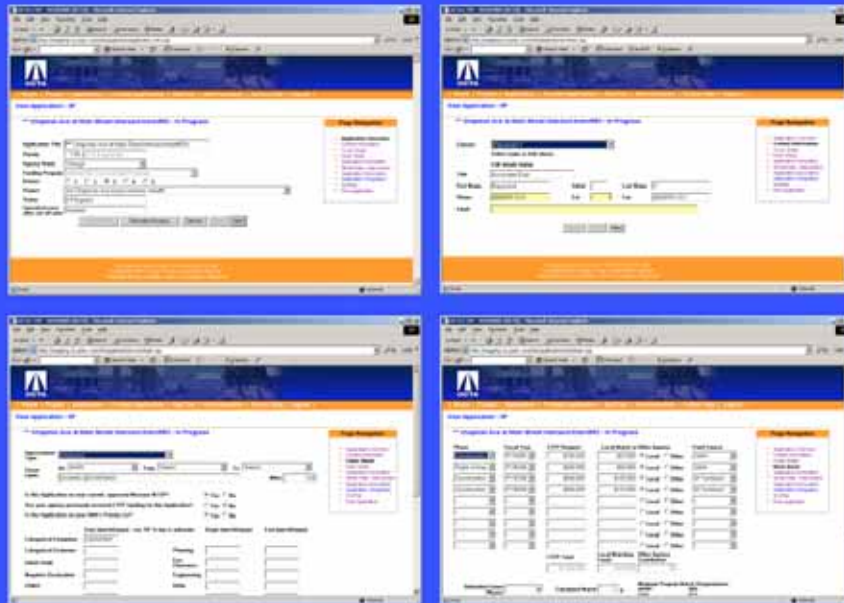




Website Diagram



CTFP – Manage Application





CTFP – Manage Application

This screenshot shows the 'Manage Application' interface. It features a header with the OCTA logo and navigation tabs. The main content area contains a form with several sections, including a 'Project Information' section with fields for 'Project Name', 'Project Number', and 'Project Type'. A sidebar on the right contains a 'Project Information' menu with options like 'Project Information', 'Project Details', 'Project Status', and 'Project History'.

This screenshot shows the 'Manage Application' interface with a table. The table has columns for 'Project Name', 'Project Number', 'Project Type', and 'Project Status'. The sidebar on the right is the same as in the previous screenshot.

This screenshot shows the 'Manage Application' interface with a large text area. The text area is empty, and the sidebar on the right is the same as in the previous screenshots.

This screenshot shows the 'Manage Application' interface with a table. The table has columns for 'Project Name', 'Project Number', 'Project Type', and 'Project Status'. The sidebar on the right is the same as in the previous screenshots.



GeoTool – Application Geography

- **Purpose of the GeoTool**
 - Capture geography from its source, in a spatial format, at the time of submittal
 - Support reviews of applications for funding
 - Identify overlapping, coincident projects
 - Identify nearby projects (phasing)
 - Built spatial database for use outside the system





GeoTool

The screenshot shows the GeoTool application in a Microsoft Internet Explorer browser window. The browser address bar displays the URL: http://ctfp.octa.net/jsp/arcgis/geoedit/map_view.asp?Cmd=popupIdApp. The application header includes the OCTA logo and navigation links: Applications, Selected Features, Orange Map, and Classes. The main map area shows a street grid with a highlighted purple line segment. A legend on the left lists: IRP, Progress, and On COLLINS from MAIN to WANDA. An 'Identify Results' window is open on the right, displaying a table of project information.

Street Feature CHAPMAN	
Project Title	Chapman
Application Title	Chapman Ave Widening
Program ID	MPAN
Project Title	Bicycle Rack on Buses Program
Application Title	Bicycle Rack on Buses Program
Program ID	TDM
Project Title	AAA Test Project for Training
Application Title	AAATest 2
Program ID	GMA
Project Title	AA Chapman Avenue Improvements
Application Title	Chapman Avenue Hublots
Program ID	AHRP



GeoTool – Edit Geography

The screenshot shows the GeoTool application in a Microsoft Internet Explorer browser window. The browser address bar displays the URL: http://ctfp.octa.net/jsp/arcgis/geoedit/map_view.asp?Cmd=STREETAddStreet-DATAVA. The application header includes the OCTA logo and navigation links: Applications, Selected Features, Orange Map, and Classes. The main map area shows a street grid with a highlighted yellow line segment. A 'View Application - AHRP' section is visible, with a sub-section 'AHS App 1 - In Progress'. An 'Add Street' section is active, with a dropdown menu showing 'BATAVA' and a 'Zoom To' button. Below the map, there is a 'Street Selected: BATAVA' label and a 'Select Street' button.

Add Street

To begin, please select a street from the list below

BATAVA

Street Selected: BATAVA

Please click the Select Street button to continue





GeoTool – Search for Overlaps

OCTA CTFP - REVIEWER (OCTA) - Microsoft Internet Explorer

Address: http://info.octa.net/infocentral/geo/tool_viewer.asp?Cmd=OverApp&Prj=05&Prj=05&Pa=05&Pa=05

Application: Selected Features: Define Help: Close

View Application: View Application: Search for Overlapping

Application: Search for Overlapping: On CHAPMAN

Search For Overlapping Geography

To begin, please select an active layer

Funded Applications

Please click the Identify Overlapping Applications button to continue

Identify Overlapping Applications

Display: GMA District



GeoTool – Search for Overlaps

OCTA CTFP - REVIEWER (OCTA) - Microsoft Internet Explorer

Address: http://info.octa.net/infocentral/geo/tool_viewer.asp?Cmd=OverApp&Prj=05&Prj=05&Pa=05&Pa=05

Application: Selected Features: Define Help: Close

View Application: View Application: Search for Overlapping

Application: Search for Overlapping: On CHAPMAN

Overlapping Applications Summary

Application Name	Program	Agency
Chapman (Cambridge to Tustin)	AHHP	Orange
Chapman (Grand to Cambridge)	AHHP	Orange
Tustin Street (Chapman to Collins)	AHHP	Orange
Tustin Street (Collins to Chapman)	AHHP	Orange
Chapman Avenue & Yale Street	SP	Orange
Bicycle Routes	TDM	Anaheim
Bicycle Back on Buses Program	TDM	OCTA
Chapman Avenue Interconnect	SIP	Orange
Yale Street (Palms to Chapman)	AHHP	Orange
Tustin St. Traffic Surveillance and Signal S/C	GMA	Orange
Tustin Avenue &	SP	Orange

Display: GMA District





GeoTool – Search Nearby

The screenshot shows the GeoTool web application interface. At the top, there is a navigation bar with the OCTA logo and menu items: Application, Selected Features, Create Map, Close. Below this, there are buttons for 'View Application', 'Search Nearby', and 'Search Map'. The main content area is divided into two sections: a map on the left and a 'Proximity Applications Summary' table on the right. The map displays a street grid with several purple markers indicating application locations. The table lists the following applications:

Application Name	Program	Agency
test	BP	OCTA
aIES App 1	ASHRP	Orange
aIES App 2	MFMH	Orange
aIES App 8	BP	Orange
aIES App 9	SIP	Orange
Main Street Rehab 15	ASHRP	Orange
aPM Lock Test	GMA	Orange



CTFP – Last Steps in Application Process

Recommend Application

The screenshot shows the 'Recommend Application' web interface. It features a table with columns for 'App ID', 'App Name', 'App Type', 'App Status', 'App Date', 'App Amount', and 'App Agency'. The table contains several rows of application data, including 'Main Street Rehab 15' and 'aPM Lock Test'.

Approve Application

The screenshot shows the 'Approve Application' web interface. It displays application details for 'Main Street Rehab 15' and 'aPM Lock Test'. At the bottom of the interface, there is a prominent orange button labeled 'Final Approval'.





Benefits of New System

- **Centralized database**
- **End-user inputs Application information through Internet**
- **End-user inputs spatial project boundary through Internet**
- **Automatic scoring and ranking of Applications**
- **Applications ready for review the day after the Call closes**



Author Information

Jim Sterling
GIS Section Manager
Orange County Transportation Authority
550 South Main Street
P.O. Box 14184
Orange County, CA 92863-1584
Tel: 714-560-5684
Fax: 714-560-5794
jsterling@octa.net

Tobias Wolf
GIS Group Manager
AMEC Earth & Environmental
5510 Morehouse Drive
San Diego, CA 92121
Tel: 858-458-9044
Fax: 858-458-0943
Tobias.Wolf@amec.com