

THE SUMMIT

News From and For The Washington GIS Community

WAURISA

The Washington State Chapter of
The Urban & Regional Information Systems Association



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THE CITY OF YAKIMA'S REAL-TIME GIS APPLICATIONS SUPPORT VITAL URBAN FUNCTIONS

Tom Sellsted, City of Yakima GIS

The City of Yakima implemented a GIS program in 1988, installing ArcInfo 5.0 to begin the task of converting paper maps and data to the digital world. Propelled by the data requirements of the Washington Growth Management Act and other municipal services the initial core projects were street centerlines, utility locations, parcel maps and land use data. Yakima's GIS program features broadly distributed data and centralized maintenance of Geographic information and mapping functions for the City of Yakima.

Public Safety mapping applications for crime analysis, fire station location studies and response-time studies opened the door to use of GIS applications for Fire, Police and Emergency Dispatching services. The ability to provide "real-time data" about emergency response vehicles has been a primary function of the Yakima GIS program since 1998. Mobile GIS using GPS-enabled communication modems provide Automated Vehicle Locations (AVL) for event, status, location and tracking information. All City of Yakima Fire, Police, and private ambulance units are now equipped with AVL.

The City of Yakima owns and operates a GPS base station for doing RTK surveys of its infrastructure. In December 1998 the City of Yakima entered into an agreement with Central Washington GIS Partnership to provide a community base station. The Central Washington GIS Partnership bought the software necessary for this service. The City of Yakima provides the hardware and a web site (<http://www.ci.yakima.wa.us/services/gps/>) to post the data sets.

See: *City of Yakima GIS, Page 2*



ALSO IN THIS ISSUE:

Yakima County GIS	p. 3
King County Parks GPS	p. 5
Mercer Island Parks Mobile Technology	p. 7
King County Lidar Based Hydro Data	p. 9
GIS Day 2006 Recap	p. 11
2007 Washington GIS Conference	p. 12
WAURISA Sponsors Page	p. 14
Editorial Page	p. 15

PRESIDENT'S COLUMN

Happy New Year and Greetings. Welcome to the Winter 2006/2007 edition of The Summit. You are in for a treat. We have gleaned "Tales of GIS" from all over the state, along with our usual profile of a state GIS professional. These articles of GIS adventure are informative and inspirational.

The big news is the upcoming Washington GIS Conference, to be held April 23rd through 25th, only three short months away. This year's venue is the new Lynnwood Convention Center. We're very pleased to bring your Conference to another part of the state!

I was very excited when it was announced that our 2007 Keynote speaker will be King County Executive Ron Sims. He has been a champion of GIS for years and continues to support its implementation in the business and service of County Government.

"Check out the WAURISA Contact Information on the back page to find out how you can get involved."

Angela Johnson once again is the GIS Conference Chair, and she can use your help if you'd like to volunteer.

Meanwhile, we are soliciting nominations for "GIS Person of the Year." This honor is for someone who has made a difference in the Washington GIS community by their dedication and professionalism. Please forward your nominations to Jaime Crawford.

Students, be sure to check our website for news about the "Student Paper Contest" for the Conference. The winner will be the first recipient of the "Dick Thomas Award" which is our first step toward a scholarship program.

Behind the scenes at WAURISA, Don Burdick is our new Education Committee lead and we are in process of developing a variety of educational opportunities each quarter in locations throughout Washington State. We are also planning outreach to students and other key groups, such as the surveyor community, to determine how we may be of service to them.

What this means is that there may be a WAURISA sponsored training opportunity coming soon to a town near you. What topics are on your radar (or LiDAR)? Does CAD/GIS interoperability pique your interest? How about addressing? GIS Developers tools? Please let Don know, or better yet, volunteer to work on the committee!

See: *President's Column, Page 4*

CITY OF YAKIMA GIS

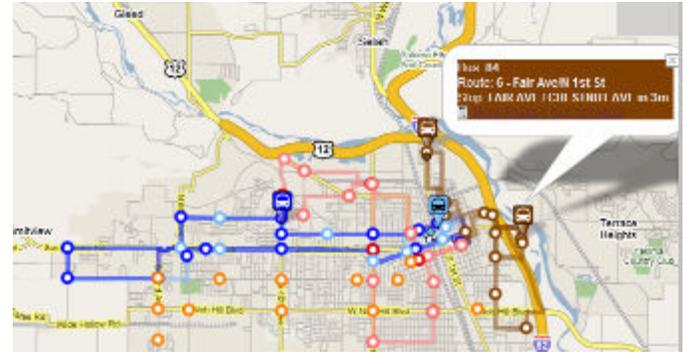
Continued from Page 1

The City of Yakima developed an application for Yakima Transit (TransitAVL) which provides "real time" tools as a result of enabling GPS technology on all Transit buses. TransitAVL allows tracking, display, and planning functions for Transit. Transit dispatchers use TransitAVL to assign buses to routes, view bus positions, and display estimated arrival times of buses on assigned routes. With this information we are also able to monitor performance. Was a bus driving too fast? Did a bus leave a stop early or late? Was a stop skipped? These are some of the questions we can now answer using AVL information. "iBus" (<http://www.ci.yakima.wa.us/gis/iBus/map.asp>), a web based version of TransitAVL was also developed to share this information with the public, leveraging Yakima's AVL/GIS/Web knowledge.

City of Yakima Refuse trucks have also deployed an AVL system. The primary purpose of the Refuse AVL program is to improve efficiency by designing optimal routes and other improvements to the existing services. The Refuse AVL data is currently employed only as a management tool for route planning and administrative purposes.

Other applications for AVL data have been developed. A Travel Speed and Delay Study was conducted in 2002 to determine the average travel speed on Arterial Streets, including control delay times at intersections using AVL. This data was critical to additional transportation studies and analysis.

Web-based interactive mapping and related services further distributes public information. The City of Yakima iMap viewer (<http://www.ci.yakima.wa.us/gis/>) allows look-up and analysis of a variety of data layers. Location of properties by parcel number, situs address or geo-coded address is available in a user-friendly format. Commonly used tools to navigate, identify or measure in the map window are employed. The map user may change the map layers being displayed, display a map legend, zoom to named places (MapMarks) or to search parcels different ways.



iBus, Yakima's Google Maps Based Transit Application

A service of the Information Systems Division with two primary staff persons, the City of Yakima GIS has transformed and updated old paper maps, as well as developed numerous data layers shared citywide among staff and the public. City of Yakima GIS has been used to support the mapping for all city departments and for a number of special studies.

The City of Yakima enjoys a supportive and cooperative relationship with the GIS staff of Yakima County as well as other regional agencies. Data sharing between the agencies ensures the most accurate and responsive product to the local governments, decision-makers and the public.

GIS Software used in the City of Yakima GIS project includes ESRI ArcInfo, ArcGIS, ArcView, MapObjects, ARCIMS and other related products.

Contact Information:

Tom E. Sellsted, Supervising Senior Analyst

City of Yakima

129 North 2nd Street

Yakima, WA 98901

(509) 576-6602

tsellste@ci.yakima.wa.us

<http://www.ci.yakima.wa.us/gis/>



City of Yakima iMap Interface



Jack Dangermond Presents 2004 GIS Award to City of Yakima Traffic Engineer Joan Davenport & GIS Program Manager Tom Sellsted



PUBLIC ACCESS & PUBLIC SAFETY DRIVE YAKIMA COUNTY GIS

Michael Vachon, Yakima County GIS



Public access and public safety are two main themes driving Yakima County Geographic Information Services. We are a small (four person) department charged with providing geographic information to the public and supporting county departments.

We are still using 'legacy' GIS tools, Unix Arc/Info and PC ArcView 3.x. The cost and maintenance of upgrading to the newer GIS models and tools are prohibitive and our user base is satisfied with the applications and products we currently provide.

One of our first public access tools was on-line parcel mapping. Initially developed by the City of Yakima, parcel mapping proved successful for many years. We decided to upgrade the web mapping and launched Yakimap.com in the summer of 2005.

Yakimap.com is not unique in providing maps, but it is unique in the speed at which it serves map pages and its business model. We chose to stay with old technology to drive Yakimap.com because of its speed and stability. Yakimap.com uses MapObjects Internet MapServer technology. While this may seem a relic of the near past, it is very stable and serves map pages at more than twice the speed of the newer mapping technologies. During 2006 yakimap.com served over 5.4 million map requests and half a million formatted and/or scaled maps suitable for printing.

Yakimap.com is partially supported by advertising revenue. There are two places for ads, a rotating banner ad in the upper corner and a larger static ad near the middle of the page. Allowing limited advertising provides a revenue stream we can use to help update the ortho-photography and replace/update the server if needed. The advertisers benefit from huge exposure to a targeted audience and the public benefits when we use the funds to maintain and update the site.

Automated Vehicle Locators

Enhancing law enforcement officer safety and dispatch efficiency is a driving force behind the development of Automated Vehicle Locators (AVL). Spring-boarding off of an application developed by the City of Yakima, we recently installed AVL in Sheriff patrol vehicles. AVL is the marriage between a GPS enabled modem and a communications network. We are using Sierra Wireless MP775 modems and the Cingular Wireless network.

Over fifty Sheriff patrol vehicles are outfitted with the rugged wireless modems. These trunk-mounted units connect to the enhanced Cingular GSM/GPRS network. This allows the Sheriff Deputy's laptop computers to connect to the county's network while providing accurate location reporting via the modem's integrated GPS (Global Positioning System) capability.

The modem transmits data packets to a specific IP address on a network. The packets arrive at the AVL server where their message is parsed (time, date, speed, heading, position, status, etc.) and written to a MySQL database for collection and later analysis. The server in turn relays the data instantaneously to a client AVL mapping application in Dispatch and back to the laptops in the Sheriff patrol cars.

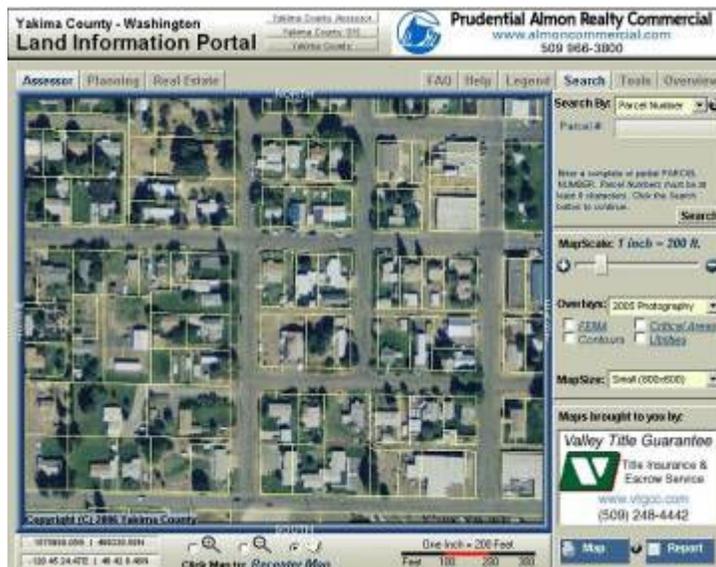
"AVL allows tracking of vehicles for officer safety and also adds to the public safety"

These AVL clients, in dispatch and the patrol cars, are running a Visual Basic application, built in-house, that uses MapObjects technology. "WhereAreView" is a light desktop GIS application with a simple set of tools that allows the user to quickly display the location, speed and heading of all vehicles in real-time, drop bread-crum trail as the vehicles move, or track a specific unit. They can also view the location of vehicles on top of ortho-photography.

This enhances the Sheriff's Office efficiency by allowing dispatchers to view vehicle location and status in real time. Dispatchers can quickly assign an emergency call to the closest available vehicle or provide directions and information based on what they see on the ortho-photos. Because the patrol vehicle is also running the mapping application, an officer is able to see the location of nearby units to determine the closest officer for backup.

Future enhancements will include installing additional GPS modems in the police vehicles of other cities and towns and exchanging AVL information with these cities so each agency can see the location of the other vehicles in real time.

"AVL is a one-time purchase that allows visual tracking of deputy vehicles for officer safety," said Sheriff Ken Irwin. "It also adds to the public safety by allowing us to quickly dispatch the closest unit to calls for service."



Screen Shot of the Yakimap.Com Web Site

See: **Yakima County GIS, Page 4**

YAKIMA COUNTY GIS

Continued from Page 3

Ortho-photography

Yakima County first acquired ortho-photography in 1992. Since then we have flown in 1998, 2002, 2004 (partial) and 2005. The Washington State Department of Transportation, Aerial Photography Branch, flew all the flights and since 1998 Yakima County GIS has ortho-rectified the imagery in-house.

WSDOT delivers the scanned imagery, generally at a scale of 1:24000, with a one foot ground sample distance, on portable hard drives. We use the Leica Photogrammetry Suite (previous version was ERDAS-Orthobase) to create the ortho-photos. Fortunately for our county we have a denser ten foot digital elevation model for much of our photo area, outside of this we use the ten meter USGS DEM.

We process the images in large blocks of up to 70 images, calibrating the raw images to the camera model, applying x,y,z control, resampling and combining into a large mosaic. Some of the mosaic files are in excess of 50 gigabytes in size. These are then chopped up into one section images and named as range/township/section.

The orthos are used extensively in-house and also on the yakimap.com web site. This is one of the most important mapping layers we have and is relied upon heavily by all our customers.

Contact Information:

Michael Vachon, GIS Director

michael.vachon@co.yakima.wa.us

Michael Martian, Senior GIS Analyst

michael.martian@co.yakima.wa.us

Yakima County GIS

<http://www.co.yakima.wa.us/gis/>

PRESIDENT'S COLUMN

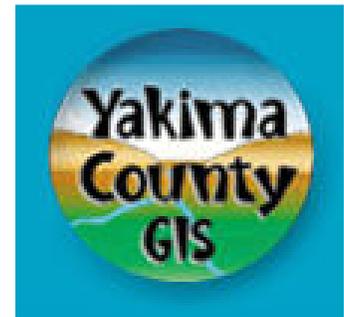
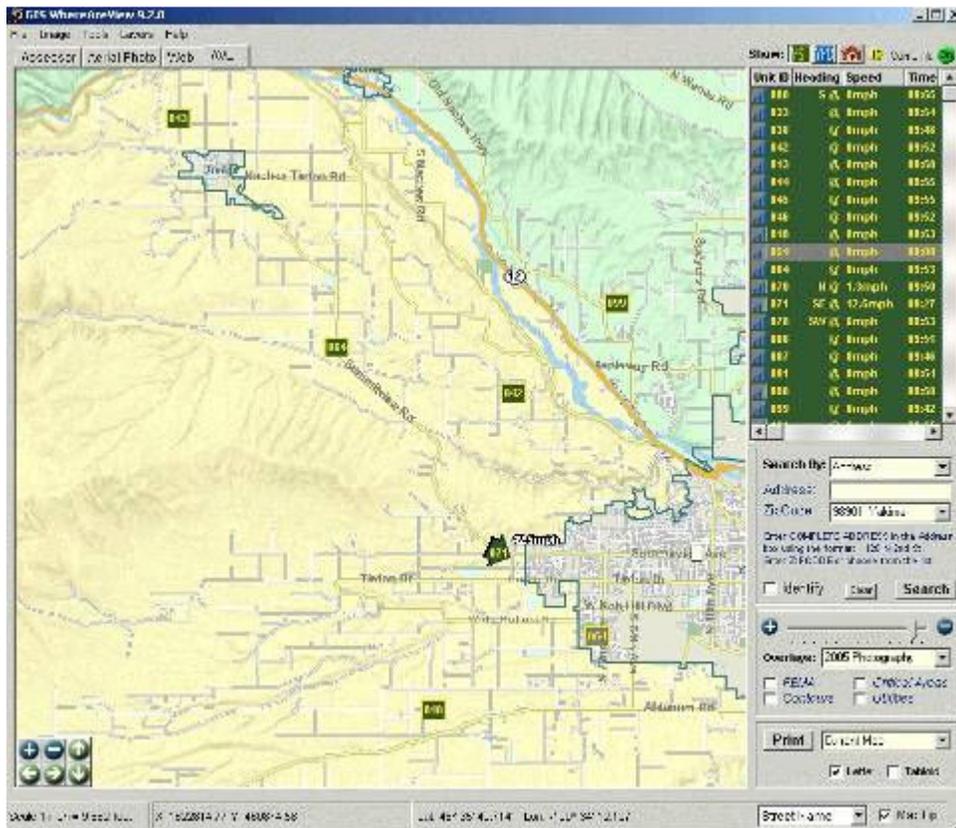
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Speaking of volunteers, you still have a chance to make a difference. Many hands make light work, and putting on a conference is a whole lot of work. Our intrepid Conference Committee is well on the way of making this the best Washington GIS conference ever, but we can't do it alone. There are still many opportunities to help. Check out the WAURISA Contact Information on the back page, and contact Angela, Jaime, Don, me, or any Board member to find out how you can get involved.

In closing, we of the Washington Chapter of URISA hope that 2007 will be a happy and healthy year for you, your colleagues, and your family.

Thank you for this opportunity to serve the GIS Community,

Rick Lortz, President



Screen Shot of the Yakima County AVL Application, Showing the Current Location of Patrol Vehicles



GPS USE FOR TRAIL SYSTEM SURVEYS IN KING COUNTY PARKS

Gavin Gray, King County GIS Center

The King County Parks and Recreation Division provides King County citizens with one of the largest regional park and trail systems in the country. The system includes more than 180 parks and natural areas, over 200 miles of local and regional trails, and 25,000 acres of land.

GIS has been used by King County Parks for more than 10 years. Since 2002, GIS services have been provided to the Parks Division by GIS staff matrixed from the King County GIS Center. The range of GIS services include data development and maintenance, data interpretation and analysis, map design and production, application development and maintenance, web services, end-user training, and project consulting.

The Parks Division first GPS unit, a hand held Trimble GeoExplorer, was acquired in the late 1990's for a community trails survey. This was a pilot project to test GPS as an alternate to the use of measuring wheels and paper notes for capturing facilities and utilities within parks. Other projects completed with this unit included a sign survey in a large active park, a trail survey in a large regional wildland park, and a pilot project to capture all facilities and utilities in a park.

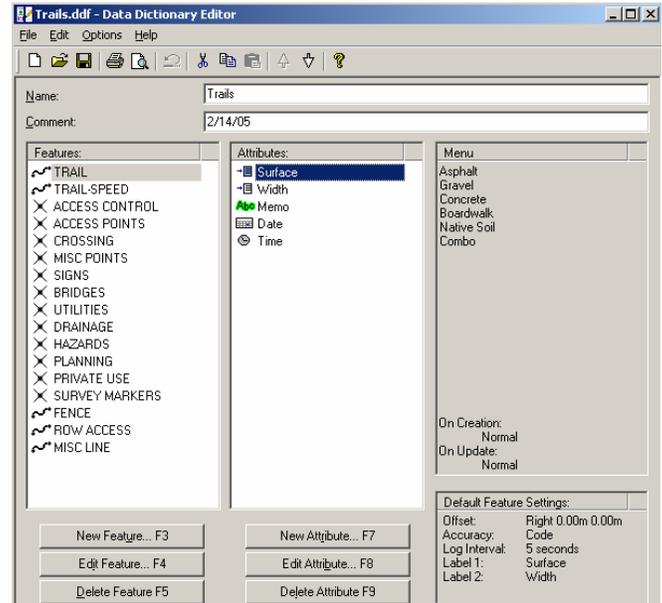
A Trimble Pro XR was purchased in 2000. This GPS unit is used by trained field staff, property managers, and the Parks assigned GIS analysts. Most data processing is done by GIS staff, but Parks staff trained to use ArcView can create their own shapefiles. "Survey" accuracy is not generally needed – the real time correction available with the unit is satisfactory for most Parks applications. Typical GPS applications include locating hazards (often downed trees), new trail locations, encroachments, survey stakes, and improving the locational accuracy of the existing facility inventory. Field staff mostly use the "Generic" data dictionary – points lines and area, with a notes field. It is now quite common for Parks property managers to take the unit out on their site visits.

Regional Trail Survey Project

In December 2004 King County Parks hired a new Trails Coordinator who was interested in familiarizing himself with the trail system. He planned to take handwritten notes himself in the field, but he soon saw the benefit of having a comprehensive trail survey completed by King County GIS using GPS.

The Regional Trail Survey Project was executed between February and August 2005. A data dictionary was developed, beginning with features we already had in our Parks database. GIS Analysts also sat down with the Trail Coordinator and Parks Property Managers and asked what else might be out there of interest of them to survey. From these discussions a Trails Data Dictionary was developed. Features in the final dictionary included:

- Trail width and surface type
- Trail crossings, trail access points
- Features – access controls, bridges, trestles, tunnels
- Facilities – benches, garbage cans, artwork
- Signage – existing and proposed
- Maintenance and hazard issues, encroachments



Trail Data Dictionary Showing Trail Feature Attributes

The survey method involved driving the trails when possible and walking when necessary. Later, a bicycle was used to speed the survey along flat paved sections of trail. The survey generally used three persons: a driver, the GPS collector, and the Trail Coordinator taking notes.

As the survey progressed, some features were added to the data dictionary. For example, two trail surface types (boardwalk and wood chip) were added after they were encountered in the field.

Data collection challenges included variable satellite coverage and strength (sometimes requiring stepping away from the vehicle) and trail underpasses and tunnels (requiring points to be taken above the top of the tunnel).

As the survey progressed, the Trail Coordinator made field decisions about required locations for new signs. Good GPS locations were acquired and put into the Parks GIS. Because the Sign Crews had no access to GPS units, GIS analysts made rough maps made for the Sign Crews and the new signs were constructed per written trail standards.

The Trail Coordinator also noted trail maintenance issues, including trail encroachments by private property owners, pavement deterioration, overgrown vegetation, damaged benches, etc.

Technical problems encountered included bad satellite availability in the afternoon later in the year, poor signals under bridges and in tunnels, and the metal car body shielding radio waves. Driving realities made exact centerlines difficult to get in the vehicle. In some areas northward facing slopes and heavy tree cover resulted in minimal or no satellite availability.



See: *GPS Use For Trail Survey*, Page 6

GPS USE FOR TRAIL SURVEY

Continued from Page 5

After the survey and data download, check maps were generated using the Trimble Pathfinder software. The Trimble data was then converted to Shapefile format and any error corrections were done in GIS. In many cases merging GPS derived data with other Parks GIS data required editing and additional field verification. Since the original survey, the Master Trail layer has become a GeoDatabase feature class.

The Trails Survey Project has had many benefits for Parks operations. Current Parks GIS data is being field checked. The Trail coordinator's notes and plans are now tied to a location in GIS. This system is cost effective – using existing equipment and staff. It provides a reality check for office-bound GIS staff – helps us to better model the real world.



Recording trail signage attributes



A GIS technician with bicycle mounted GPS often proved more efficient



GPS Derived Trail Feature Locations Displayed on Aerial Photo

Future possible applications include resurveying existing trails on a periodic basis, surveying new 'as-built' trail construction, surveying non-King County Parks regional trails, and locating routes for future regional trails.

The existing ProXR GPS unit being used effectively – hence there is no urgency to replace it. However, the old backpack unit has heavy lead batteries. Its antenna, wires and cables are cumbersome and it cannot take advantage of new features. In the interim two Thales MobileMapper GPS units were purchased for field staff, so they will not always need to come downtown to get the Pro XR unit.

Contact Information:

Gavin Gray, GIS Analyst

King County GIS Center (www.metrokc.gov/gis)

Gavin.Gray@metrokc.gov

King County Parks Information: <http://www.metrokc.gov/parks/>



MERCER ISLAND PARKS WEB-BASED MOBILE TECHNOLOGY

Peter M. Mayer, Director
City of Mercer Island Parks and Recreation Department

Mercer Island Parks and Recreation has been working to deploy a web based maintenance management program integrated with GIS functionality. While many agencies use manual or computerized maintenance management systems (MMS), few provide an integrated mapping component. The benefits of a GIS-integrated maintenance work order system include:

- Flexibility for staff who are more comfortable with a graphical map tool than a web-based program with multiple drop-down boxes;
- The ability to maintain all asset attributes in a GIS database rather than re-create them in a separate standalone database;
- Greater asset tracking and data analysis;
- Greater GIS functionality to analyze and assess maintenance data.

Mercer Island Parks ultimate vision is a web based application for customers, residents, or staff to enter work order requests and generate a trackable work order. Parks staff would then investigate the work order using mapping tools, assess the situation, and respond to the work order via a hand-held mobile device. The same process would support routine and preventative maintenance tasks.

Mercer Island's Public Works Department has evolved its MMS, selecting Web Work (Tero Consulting, Coquitlam, BC) in 2001 for processing customer trouble requests, performing preventative maintenance tasks, and tracking routine maintenance activities.

Parks also began to implement Web Work as its MMS. However, with the rapid development of GIS technologies and the City's desire to maintain all of its assets (storm drainage, sewer, water, meters, street trees, traffic signs, etc) in one common "place" within GIS, Parks pursued an integrated solution to also place these powerful tools in the hands of Parks maintenance staff while in the field.

With no additional resources available to develop this ability, staff set out to phase in the use of the MMS while collecting needed GPS data on park assets (i.e., benches, tables, BBQ's, fields, fences, drinking fountains, etc). A 32-acre multi-use neighborhood park, Island Crest Park, was selected for a pilot project because of its vast amenities, including two athletic fields, open space, trails system with suspension bridge, children's play area, batting cages, tennis courts, restroom facilities and other park amenities. A Parks GIS intern began locating the various park features with a GPS unit.



While internally advocating the need to invest some dollars in this innovative project, staff advanced two I.T. CIP budget requests that were subsequently approved by the City Council for the 2005-06 biennium: 1) development of a technical bridge between GIS and Web Work (\$15,000) and 2) data inventorying and purchasing of needed hardware/software/accessories to implement the project in Parks (\$20,000). These funds then enabled a number of other tasks to occur.

Parks developed a working spreadsheet of the kind of data desired for each feature (i.e. size/dimensions, surface/material types, serial numbers, manufacturer, etc.). What began as a large data list was refined into a pared-down set of fields in which to collect information. While the GIS intern collected X/Y coordinates for park features, discussions began with Tero Consulting to determine how to build a technical bridge between Web Work and the City's GIS.

At this point, these were two stand-alone systems that did not communicate or cross-reference data. Mercer Island GIS Coordinator Mike Onzay and the City's I.T. Manager continued to analyze the technical architecture of Web Work while the Web Work System Administrator and the City's Public Works Department helped Parks staff better understand how Web Work operates and processes information. Parks staff began developing procedures, tasks, frequencies, and levels of service for park assets and began entering data into the Web Work system. Specific maintenance activities (i.e. aerating, mowing, park checks, etc.) were developed along with time standards. Several GIS students from the University of Washington helped staff refine data fields and methodology as part of a school project.

Tero Consulting announced their intention to enhance Web Work with GIS functions. The City obtained the services of a third party GIS consultant (Karl Johansen, Port Madison GIS) to review the issues, technical solutions, costs and resource requirements surrounding the integration of Web Work with the City's GIS prior to committing to Tero's GIS-Web Work solution. The City wanted to ensure that the solution was affordable, practical, technically sound, and sustainable. The study found

"...there is a clear business case to be made for moving beyond the current status quo with both Web Work and GIS. It is recommended that the city proceed conservatively to explore the feasibility of enhanced usage of both systems..."

Recommendations included: 1) better cross-referencing of data between the two systems to eliminate synchronization conflicts (Web Work data fields were labeled differently than GIS data fields); 2) testing of the Web Work Field Module should be expanded in a field test by Parks staff using wireless technologies; and 3) off-site hosting of the Web Work application by Tero Consulting should be re-examined based upon increased use and using the same server database for assets common to both systems.

See: Mercer Island Parks Mobile Technology, Page 8

MERCER ISLAND PARKS MOBILE TECHNOLOGY

Continued from Page 7



MI Parks Employee With Vehicle Mounted Laptop



MI Parks Employee Operates Irrigation Zones Via Laptop

The consultant recommended the City initially implement the project without the systems fully integrated, i.e. both applications could be up and running on a mobile device, but data would not flow between the two. To get the project implemented, staff agreed with this recommendation. Meanwhile, the City's I.T. Network Administrator initiated contact with software developers and senior management at Tero Consulting and identified the few technical details still needed to create the bridge. This limited amount of work is underway by Tero Consulting and when completed will allow staff to "drill down" on a map to access information on a particular park asset, report a problem, record maintenance activities, query an asset for an as-built drawing, or print a report.

Mercer Island ordered two mobile GoBook III laptops (Itronix) with integrated EVDO (high speed) wireless wide area network (WWAN) cards that connect via an RSA encrypted VPN (Virtual Private Network) tunnel to the City's GIS and Web Work system with web based interfaces. Vehicle mounting kits with power connections were installed in two Parks vehicles so staff could either work from their vehicle or take the laptop out into the field.

Lessons Learned: As a result of this pilot project, a number of lessons were realized, including:

- Start small- pilot test using one park/area
- Pre-plan
 - Identify goals & objectives
 - How much detail is desired?
 - Find out what data already exists and in what form
 - Organize data to determine gaps/inconsistencies
 - Insure compatibility w/existing software systems & willingness of vendors to support GIS/GPS functions
 - Develop solid data collection strategy
 - Anticipate needs beyond today
- Garbage In/Garbage Out (GIGO)
 - Strive for accuracy the first time
 - The park inventory provides the foundation for everything else
 - It's a continuous process
- Mobile technologies don't replace traditional communication methods
- Seek I.T. & GIS support and know what the limitations are before deploying

HP 460wbt Bluetooth wireless printers provide the ability to print information in the field. The GoBook III's offer other robust features, including Bluetooth, GPS, Touch Screen functionality, water resistance, and military standard ruggedness. Start-up costs for one complete mobile system was approximately \$5,500 (including printer) and a monthly cost of \$60 for the WWAN card.

As hardware was ordered and began arriving, existing web resources were identified that could be accessible from the mobile laptops using their wireless air cards. Key documents and images (irrigation as-built's, restroom plans, asset specifications, valve details, etc.) were scanned and converted into PDF's to allow remote access.

The City also implemented new baseball field lighting system controls at Island Crest Park. The "Control Link" system (Musco Lighting) replaced existing time clocks and manual switches with remotely operated controllers. City staff with assigned passwords can operate the lights via a 1-800 phone number or website in the office or on their laptop, thereby eliminating costly call-outs to turn on or off lights.

Maxicom, the City's computerized irrigation system was also loaded on the laptops, to allow Parks staff to activate and deactivate park irrigation zones from anywhere in the field or from home. The City's activity registration and facility scheduling software, Active Network's CLASS system, was also made web ready, providing ballfield maintenance staff real-time data about practice or game day changes and other facility related rentals and needs.

A second phase of implementation budgeted for the 2007-08 CIP would allow the GPS based inventorying of assets in several other large parks and provide mobile technology tools to the other parks maintenance staff. Continued data entry and use of Web Work will enable improved tracking of maintenance issues and identify reoccurring problems that would have otherwise been overlooked.

Contact Information:

Pete Mayer,

Assistant City Manager/Parks & Recreation Director

City of Mercer Island

Pete.Mayer@mercergov.org

<http://www.ci.mercer-island.wa.us/>



KING COUNTY WATERCOURSE AND DRAINAGE BASIN GIS DATA REDEVELOPMENT

Victor High, King County GIS Center

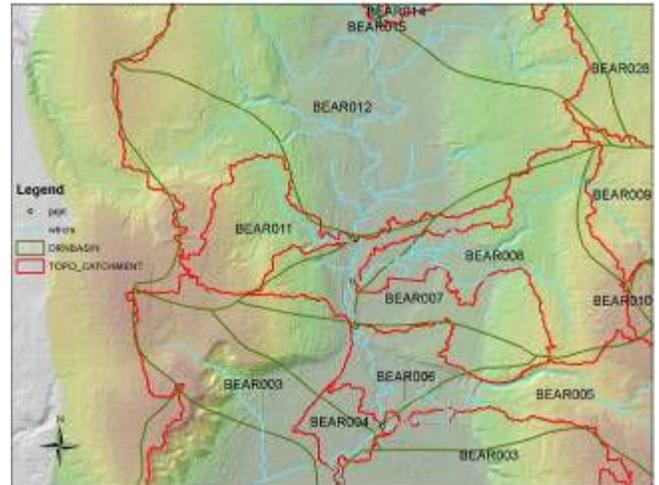
The King County GIS Center recently redeveloped its Streams and Rivers (WTRCRS) and Hydrological Drainage Basin (DRNBASIN) data layers using Lidar and Orthophotography data dated 2002. This work was executed under the guidance of the Hydro Work Group of the King County GIS Technical Committee.

One of the main problems with King County's WTRCRS and DRNBASIN data was inaccurate geometry. Both data sets had been digitized originally from USGS paper quadrant maps in the early 1990s. They were useable at scales of 1:24,000 and larger, but lacked accurate detail. When King County acquired Lidar data in 2003, it was decided to rebuild the WTRCRS and DRNBASIN layers using the Lidar data. Lidar data is much higher in detail than the existing USGS 10 meter digital elevation model and it was thought that the Lidar could easily delineate the stream course geometry more accurately than the existing water course.

Unfortunately, after some initial tests, it was determined that Lidar could not accurately delineate streams in a consistent manner. The data contained noise from the 'Virtual Deforesting' or vegetation and building removal. Streams would follow a stream bed then "Jump out" of the stream bed because of left over vegetation elevation bump anomalies in the path of the stream. The stream would go through buildings, trees, and fields and then back into the stream bed. Also, the line work was very crooked because of the 6 foot cell size in the ground model DEMs. The lines would have to be generalized to smooth them and the attributes transferred to each line.

After some thought on the most cost effective way to improve the existing stream geometry, it was decided to modify the existing geometry using a combination of Lidar and orthophoto resources. Each line was looked at and adjusted by heads up digitizing using Aerial Orthophotos, Lidar elevation, slope, aspect, hillshade, accumulation, and contour products as guides to help determine the stream path. Most cases involved following a visible path in the orthophoto. In cases where the stream becomes obscured by vegetation, the Lidar products would be used to determine the path. In urban areas where streams go into underground pipes, utility drainage data was used where available. Each line is given a confidence rating in geometric accuracy: 1 for 'good,' 2 for 'questionable,' and 3 for 'should be deleted.' It took one intern a year and a half to complete this task for the entire county.

When the streams and rivers water course geometry for a basin was completed, the drainage boundary for the basin was ready to build. The water course lines were used to "Burn" a stream path into the basin DEM for a more accurate accumulation and stream delineation. Each line had an attribute for depth. The default value for each line was 10 feet. This means that a 10 foot groove was cut or burned into the DEM. In areas of tall freeway berms or dams, the depth would be increased to assure a correct path through obstacles, simulating underground culvert drainage. A good Lidar delineated stream was necessary for delineating accurate drainage basin boundaries.



Map showing DRNBASIN and new TOPO_CATCHMENT boundaries

The drainage basin boundary data has political as well as physical uses. The new basins should be more topologically accurate, but in some cases they are very different in size and shape from the original data and may conflict with existing basins politically. Because the Hydrography Work Group did not want to disrupt existing applications, it was decided that an old and new version of the drainage basin data would exist in parallel until complete buy off by County users and policy makes before the old version can be completely replaced. The new layer is called TOPO_CATCHMENT, for topologic derived basins at the smallest basin catchment level.

Drainage basins were rebuilt using Arc/Info 8 & 9 Grid watershed commands in AML. Pour points were added in ArcMAP as shapefile points using the existing DRNBASIN as a guide. Attributes from the existing DRNBASIN layer were also transferred to the new basins by the same AML. When all of the County's basins were complete, they were merged together in ArcGIS Model Builder into the Personal Geodatabase layer TOPO_CATCHMENT. Topological rules were applied for "No Gaps" and "No Overlaps" and all errors fixed. The old catchment ID list was compared to the new for quality assurance.

When the master layer TOPO_CATCHMENT was completed, it was imported into SDE. A python script joins and calculates Basin, Watershed, and WRIA names and id numbers, then dissolves the catchments into TOPO_BASIN, TOPO_WATERSHED, and TOPO_WRIA.

Contact Information:

*Victor High, GIS Analyst
King County GIS Center (www.metrokc.gov/gis)
Victor.High@metrokc.gov*

King County GIS Data Catalog: <http://www.metrokc.gov/gis/sdc>



MEET DEBORAH HAYNES, GISP SENIOR GIS ANALYST

My name is Deborah Haynes and I am a Senior GIS Analyst in Marysville, Washington. I received a BA in geography and German from the University of Wisconsin, Madison in 1992 and a Certificate in GIS and Remote Sensing from Humboldt State University, Arcata, California in 1998. I started out as a part-time GIS Technician at Geographic Resource Solutions while in school at Humboldt State University.

After receiving my certification I landed a job at Snohomish County as a GIS Technician where I worked on a parcel conversion project. A year later I transferred to the Surface Water Management Division of Public Works where I continue to work today on storm water-related issues.

I got into GIS when I attended an ArcView training session in the mid 1990s while working for the U.S. Forest Service. I knew right away that I wanted to use this new software and work in the field of GIS. I tried finding work in the GIS field without continuing my education but found that I really needed training to land the jobs I wanted.

Some of my contributions to the profession include being a Washington URISA member for many years as well as a Society for Conservation GIS member.

I like the breadth of the GIS field. You can use GIS in so many different fields, from real estate to public health to storm water. For me, personally, the biggest challenge is trying to stay on top of all the new technology. For the field of GIS, the challenge I see is managing all the data and coordination between different agencies. I was proud to receive my GISP certification. I have encouraged my coworkers to apply as well. There is a lot of variation in job descriptions and job titles in the GIS profession. One great advantage of the GISP certification is that it is consistent worldwide.

I am married with one two-year-old child and another on the way. I enjoy spending time with my family, vacationing on Vancouver Island, B.C., and hiking and biking when I have time!



Deborah Haynes profile was first published by the GIS Certification Institute in GISC-EYE Volume 2, Number 2 Summer 2006, See: www.gisci.org



Editor's Note: As of December 25, 2006, there were 1,376 GISPs worldwide, including 34 in Washington State. For more information about the GIS Certification Institute and the GISP Program, see: <http://www.gisci.org/>

UPCOMING URISA EVENTS AND CONFERENCES:

Integrating GIS & CAMA Conference

March 4-7, 2007
Las Vegas, NV
http://www.urisa.org/gis_cama

Northern Rockies Chapter of URISA Intermountain GIS Conference 2007

April 2-6, 2007
Donnelly, Idaho
http://www.intermountaingis.org/conference_2007.html

Geospatial Integration for Public Safety Conference

April 15-17, 2007
New Orleans, LA
<http://www.urisa.org/gipsc>

GIS in Action

April 17-18, 2007
Vancouver, WA
<http://www.orurisa.org/events/gisinact/2007event/index.html>

2007 Washington GIS Conference

Sponsored by WAURISA: The Washington Chapter of URISA
April 23-25, 2007
Lynnwood Convention Center
See: <http://www.waurisa.org/conferences/index.html>

GIS in Public Health Conference

May 20-23, 2007
New Orleans, LA
<http://www.urisa.org/conferences/health>

URISA's 45th Annual Conference

Urban and Regional Information Systems Association
August 20-23, 2007
Washington, DC
<http://www.urisa.org/conferences/aboutannual>



GIS DAY 2006 RECAP

GIS Day 2006 was celebrated on November 15 in many parts of Washington State. Here is a recap of two successful events. GIS Day 2007 is November 14. For more information and to plan your event, see: <http://www.gisday.com/>.

GEOGRAPHIC INFORMATION IS A HIT WITH PIERCE COUNTY STUDENTS !

Hundreds of Pierce County 5th or 6th graders came home last November to tell their families and friends about Geographic Information Systems (GIS) and computer based mapping.

Pierce County GIS professional from Planning and Land Services, Water Programs, Information Technology and Sheriff's Office partnered with City of Puyallup, City of Gig Harbor and ESRI to demonstrate Geographic Information System (GIS) technology to 1,455 5th and 6th graders. These GIS professionals visited 53 classrooms at 13 schools in 7 school districts and one private school and shared their knowledge with the students during GIS Day 2006.

Common comments from the teachers were, "The students were amazed at the various uses for geography in everyday life and occupations. Of course their favorite part was the map guessing game! The packet of information and the list of geography websites will be very useful as we continue to teach our students geography throughout the years." Schools that would like a GIS Day presentation in 2007 should contact Brandy Riche, Pierce County GIS, 253-798-4929.



Pierce County GIS Day Classroom Session



*Mike Onzay, Mercer Island GIS Manager
With GIS Day Display*

MERCER ISLAND GEOGRAPHIC AWARENESS WEEK

Mayor Bryan Cairns declared November 16, 2006 as 'GIS Day' for the City of Mercer Island. City Hall was the site of a week-long exhibit on the use of GIS technology. Pete Mayer, Mercer Island Director of Parks and Recreation, called GIS the city's most valuable tool for analysis, planning, decision making and problem solving. "It really serves as the foundation for much of our decisions we make as a city." Pete Mayer said. "It is an important tool for city planners and builders."

SPOTLIGHT ON WAURISA BOARD MEMBER: RICK LORTZ

Dedicated board members and volunteers are critical to the success of WAURISA. Rick Lortz has been involved with WAURISA for many years, serving as Treasurer and now President. Rick led the effort to revitalize the Chapter, coordinating the re-writing of the Chapter by-laws and steering us to the 2006 URISA Chapter of the Year Award. When *The Summit* asked him for his professional background and interests, Rick replied:

I grew up in a small Montana town and moved to Seattle in 1972 to attend Burnley School of Art. After driving taxi, and holding sundry odd jobs, I attended the RJ Horn School of Drafting. Soon thereafter, I started working for a small engineering firm performing drafting and surveying duties.

Ironically, my first drafting job was tracing road outlines for USGS quad maps using a lining pen on linen. One could say that was my introduction to the 'geographic' aspect of GIS. At a later employer I was responsible for a water district's facility maps. That was my introduction to what could be loosely termed 'information system' as we manually drafted and tracked the number of valves, hydrants, and total pipe footage.

In 1988 I started working at Lakehaven Utility District and was soon tasked with consolidating various manual mapping systems. In preparation, I took computer classes and CAD training. We then acquired AutoCAD (v.9) software and hired temps to assist me. Thus began a 4 year process of digitizing the county assessor's maps, as well as the district's water and sewer information, into 164 drawing files. The result of our labors was the creation of a CAD AM/FM system which has been used to produce a myriad of cartographic products including map books, wall maps, and supported a map viewing application. It was also used, though primitively, to track our facilities.



See: Rick Lortz Spotlight, Page 13

Washington GIS Conference 2007

Foundations for the future...

April 23-25, 2007
Lynnwood Convention Center



The 2007 Washington State GIS Conference, "Foundations for the Future!" will be held Monday through Wednesday, April 23, 24 & 25, at the new Lynnwood Convention Center. WAURISA - the Washington State Chapter of the Urban & Regional Information Systems Association - is finalizing a program that includes a day of educational workshops, access to leading GIS vendors, and two days of informative speakers from all corners of the State. The Conference is designed to help you learn from your colleagues, network with your peers, and build a solid GIS foundation for your career, your company, or your agency.

The event begins on Monday with a day of in-depth educational Workshops. The Workshops offer in-depth technical training from some of the leading GIS practitioners from throughout the Pacific Northwest and have become a successful part of the annual Conference.

On Tuesday, the conference kicks into full swing with a keynote address by King County Executive Ron Sims. While on the County Council, he was instrumental in initiating the King County GIS program. As Executive, Ron Sims' has strengthened the foundation of King County's GIS, while challenging it to become an innovative regional service provider. Ron Sims is a nationally recognized leader and highly motivational speaker who will share his vision for the future.

Following the keynote, the 'GIS Person of the Year' will be announced and speaker sessions will begin. We are excited to have speakers covering a variety of session this year including:

- GIS Management
- Utilities
- Web Solutions
- LiDAR
- Small Government
- Crime Analysis
- Transportation
- Tribal Government
- Student Papers

In addition to speaker sessions on Tuesday and Wednesday, we will also have poster displays and a map competition to showcase some of the great work being accomplished around the State. Vendors will be on hand to demonstrate their products and answer any questions about services they offer. Your registration also includes lunch each day.

A Tuesday night Social (Details TBD) will be an opportunity to unwind and relax with your colleagues in a friendly and fun atmosphere.

For 2007 Washington GIS Conference registration information, please visit our website <http://www.waurisa.org/conferences/index.html>

We hope to see you in Lynnwood in April!

Keynote Speaker: Ron Sims



King County Executive Ron Sims has built his career in public service around the progressive principles of social justice, good government and environmental stewardship. He has a national reputation for boldness and vision, and is a champion of reforming government processes to better serve the people of the dynamic, forward-thinking Puget Sound region.

As Executive, he is charged with overseeing the 13th largest county in the nation. It includes the city of Seattle, and with an overall population of 1.8 million, King County is home to about 30 percent of Washington state's population and alone accounts for more than 40 percent of the state's jobs.

As a member of the Sound Transit Board of Directors, Ron Sims public service also extends to Pierce and Snohomish Counties.

It's not too late to be a presenter at the 2007 Conference. Papers are being solicited for a variety of technical, project, management, and student tracks. Abstracts can be submitted to: abstracts@WAURISA.org

For more information check the WAURISA Web Site: <http://www.waurisa.org/conferences>

WAURISA

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The GIS
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sessions on Tuesday and Wednesday
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For more information about GIS
Certification, see: <http://www.gisci.org/>



2006 WASHINGTON GIS CONFERENCE PHOTO RECAP PLANNING FOR 2007 CONFERENCE PROMISES AN EVEN BETTER EVENT



2006 Attendees Register in Tacoma



ESRI's SJ Camarata Gave the Keynote Address



Who Will Win 2007 Summit Award?



Vendors Were Busy Meeting With Conference Attendees



Sunny Day for the Tuesday Social Event



Amanda Taub Announces Map Contest Winners

More exciting 2007 Washington GIS Conference Details will be announced soon. Look for details in your inbox from SummitGISNews@URISA.Org, in the mail, on the WAURISA web site (www.WAURISA.ORG), and in the Spring 2007 Issue of the Summit.

**See You in Lynnwood
in April!**

Washington **GIS**
Conference 2007
Foundations for the future...

RICK LORTZ SPOTLIGHT Continued from Page 11

A few years ago we decided that all our CAD facility data, along with ancillary data, should be migrated into a Geodatabase. With the help of a consultant, we were able to consolidate our facility data along with our record drawing image files and digital color orthophotos. There was significant clean up necessary to prepare our data and it was humbling to find out just how 'dirty' my CAD data really was.

We are now using ArcSDE on SQL Server to manage our data and ArcIMS to distribute it over an intranet application called LIOn (Lakehaven Infrastructure On-line). We are developing a system using Publisher and ArcReader to provide our data to field GIS on their laptops. My time now is primarily devoted to learning these new systems, and data scrubbing.

My GIS education has been acquired by attending workshops at conferences, training sessions when offered, 2 quarters at GRCC learning ArcInfo, the GIS Certificate program at the UW in 2001/2, and lots of hands on discovery. My background in the Civil Engineering field has helped me to become proficient in both the CAD and GIS software.

I've been involved with WAURISA since the 1999 conference in Fife. After serving as treasurer for 5 years I was asked to be president in 2005. My most satisfying times have been participation in the planning and execution of the annual conference, as well as other educational events. I have been watching with keen interest the issue of CAD vs. GIS, their evolution, and their place among other professions. It is very exciting to be part of a new profession.

On the domestic side, I've lived the life of a squire on my property in the Maple Valley area where I've raised chickens, ducks, pigs, and cows. Remaining is my faithful hound, Zeke. I also care for several fruit trees and have had a salsa garden for many years. The bulk of my leisure time is spent reading, reading with a focus on ancient history (before CE) though I find the crusades and other more recent civilizations (Aztec) especially fascinating.



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Dell Computer Corporation
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www.insideoregon.com/gis/

6th Annual Seattle Open House

Join ESRI on Thursday, February 15th at our Seattle offices where we'll be presenting on the development, functionality, and system design of ArcGIS Server technology. Seating is limited, so register online at: www.esri.com/events



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www.metrokc.gov/gis



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www.krollmap.com/



Seattle GIS
www.cityofseattle.net/gis/

The Summit reaches more than 2500 readers across Washington State. For more information about the benefits of WAURISA Sponsorship, contact Rick Lortz (rlortz@lakehaven.org), or any WAURISA Board member.....

THE SUMMIT - EDITORIAL

BIOSPHERE 1

The year 2007 marks 20 years since Biosphere 2 was constructed in Oracle, Arizona. Intended for experiments on environmental manipulation and testing the feasibility of space colonization, two teams in the 1990's conducted sealed missions of two years and then six months duration in the futuristic structure. Now Biosphere 2 is just a tourist attraction and may soon be torn down for a real estate development.

Of course we in the Washington GIS Community are interested in our little portion of Biosphere 1 – the earth we call home. Unlike Biosphere 2, Biosphere 1 is not an experiment, but our home (and the only one we have) so we can't mess it up. Readers of *The Summit* know that GIS can play a crucial role in protecting Washington's environment, creating a vibrant economy, and passing on our natural resources for future generations.

This issue of *The Summit* presents an interesting mix of articles. The City of Yakima and Yakima County demonstrate how agencies can work together and yet develop distinctive and dynamic GIS operations. The Mercer Island and King County articles illustrate related application of GPS and mobile technology for Parks management.

Another opportunity for the GIS community is coming up in April – the 2007 Washington GIS Conference. The success of our conference in 2006 was a key reason that WAURISA was chosen 'Chapter of the Year' by URISA in 2006. Look for more news soon about the Washington GIS Conference and about other educational opportunities that WAURISA will be offering.

2007 marks the (approximately) 5 billionth anniversary of Biosphere 1. Our goal is to be an important resource for the Washington GIS Community as we live, work, and play in Washington and continue our own missions on Biosphere 1.



THE SUMMIT— LITERARY CORNER

LiDAR derived data is useful for watercourse data development (see article, Page 9). Shakespeare wrote about watercourse mapping:

"I think it is in Macedon where Alexander is born. I tell you, captain, if you look in the maps of the 'orld, I warrant you shall find, in the comparisons between Macedon and Monmouth, that the situations, look you, is both alike. There is a river in Macedon; and there is also moreover a river at Monmouth: it is called Wye at Monmouth; but it is out of my brains what is the name of the other river; but 'tis all one, 'tis alike as my fingers is to my fingers, and there is salmons in both."

-Fluellen, in *Henry V*, by Shakespeare

The Summit is published by WAURISA, The Washington State Chapter of the Urban & Regional Information Systems Association

Newsletter Editor: Greg Babinski

Interview Editor: Effie Moody

For subscriptions, content, comments, or suggestions, email:

SummitGISNews@URISA.org

PUBLIC MAPS IN WASHINGTON

I commute each day to my job in Seattle via Sound Transit. Recently, as I settled into my seat on the Sound Transit route 550 bus, I noticed something about the upholstery that I had not noticed before. The seat upholstery design is a stylized map-like image of the Puget Sound region that Sound Transit serves. This got me thinking about other examples of public map displays and I realized that I could think of quite a few. Some examples are presented in this issue and I hope to present more in future issues. If you know of a public map display in Washington, feel free to send it to *The Summit* and we'll include it in a future issue.



Sound Transit's 'Puget Sound' Design Bus Seat Upholstery

After I step off my bus in downtown Seattle, the route to my office takes me past this manhole cover. Designed by Ann Knight as part of a Seattle Arts Commission project, each of 19 covers produced weighs 230 pounds. A stainless steel button on each cover indicates its location on the map.



The Summit would like to hear from you. To encourage the discussion of issues and ideas of importance to the Washington GIS community we welcome letters to the editor and opinion essays. Letters to the editor should be a maximum of 100 words and essays should be limited to 250 words.

UPCOMING GIS EVENTS IN WASHINGTON

ACSM – Washington State Section

<http://www.wss-acsm.org/>

ASPRS Puget Sound Region

<http://www.photogrammetry.com/ASPRS-PSR/>

Central Puget Sound GIS User Group

<http://waurisa.org/phpBB2/viewforum.php?f=24>

Meetings the 3rd Tuesday of each month from 1:00 to 3:00pm at

Mercer Island City Hall. Contact Nora Gierloff at:

ngierloff@ci.tukwila.wa.us

Central Washington GIS User Group

<http://www.cwgis.org/>

Meets the 1st Friday of each month at the Wok-About Grill, 110 N

Wenatchee Ave, Wenatchee, WA at 12:00 noon.

King County GIS User Group

http://www.metrokc.gov/gis/KC_Users_Group.htm

Meets 1st Wednesday of each month at 11:00am at the KCGIS

Center, 201 S. Jackson Street, Seattle WA, Conf Room 7044/7045.

Northwest Washington GIS User Group

http://www.acadweb.wvu.edu/gis/nwgis_mtg.htm

Spokane Regional GIS User Group

<http://waurisa.org/phpBB2/viewforum.php?f=19>

Contact: Dave Rideout, Spokane County 509-477-7251

drideout@spokanecounty.org .

2007 NW ESRI User Conference

<http://www.nwesriusers.org/>

2007 URISA Conference, August 20-23, 2007, Washington, DC

<http://www.urisa.org>

2007 GITA PNW Chapter Conference

<http://www.gita.org/chapters/pacific/index.htm>

2007 Washington GIS Conference: April 23-25, 2007, Lynnwood, WA

<http://www.waurisa.org>

To have your GIS related event listed in future issues of *The Summit*,

notify the editor at: SummitGISNews@URISA.org.

To be added to *The Summit* mailing list, contact:

SummitGISNews@URISA.org

Back issues of *The Summit* are available at:

<http://waurisa.org/thesummit/>



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WAURISA COMMITTEE VOLUNTEERS

Glenn Brooks: brooks.glenn@comcast.net
 Cort Daniel: cort.daniel@co.pierce.wa.us
 Doug Day: dday@esri.com
 Kristina Evanoff: evanoffk@soundtransit.org
 Tami Griffin: griffit@wsdot.wa.gov
 Tia Hillerman: thillerman@highlinewater.org
 Reily Love: webmaster@waurisa.org
 Emilio Mayorga e.mayorga@co.snohomish.wa.us
 Effie Moody: effie.moody@seattle.gov
 Dave Rideout: drideout@spokanecounty.org
 Heather Spates: spatesh@wsdot.wa.gov
 Mike Strong: Mike.strong@cityoffederalway.com
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Interested in volunteering your time to help WAURISA?

Contact Rick Lortz or any Board member listed above.

JOIN THE WASHINGTON GIS COMMUNITY FORUM!

The Summit is not the only communications resource available to members of the Washington GIS Community. Sign up as a member of the Washington GIS Community Forum (<http://waurisa.org/phpBB2/index.php>) and access the latest news about GIS jobs, training, projects, and professional activity in Washington State.