

ORMAP Grant Application - 2004 Spring/Fall Request

Section I. County and Grant Information					
a. County/Region Multnomah County/R-MAP		b. Type of Funding (Check only one)		c. Grant Request (Only the amount for the funding type selected in Section I.c)	
		<input checked="" type="checkbox"/> Regional <input type="checkbox"/> Discretionary <input type="checkbox"/> Combination (For grants requesting both type of funds in one project)		Discretionary Fund Request \$	
Project will help ORMAP Goal(s): 1 2 3 4				Regional Fund Request \$90,500 - 77,600	
Section II. Summary of Project					Tech Group Assessment
a. Brief Description of the Request and if the project will meet the ORMAP Data Exchange Standards.					<input type="checkbox"/> Yes <input type="checkbox"/> No
To meet GOAL 4: Completes Interoperable Data Model. Using Goal 2 Taxlots as a base, creates clean Base Map polygons. Provides GIS Education and Training for 1 year for A&T staff. Provides Oracle support for 1 year as needed. Provides additional memory for server. Will meet current data exchange standards.					
Scope and Detail of Deliverables					<input type="checkbox"/> Yes <input type="checkbox"/> No
<i>Check</i>	<i>Deliverables</i>	<i>Details</i>			
<input type="checkbox"/>	Taxlot Conversion	Number:		Percent of County:	
<input type="checkbox"/>	Tax map Conversion	Number:		Percent of County:	
<input type="checkbox"/>	Control Points	Describe			
<input checked="" type="checkbox"/>	Hardware/Software	Describe	\$1500 Additional memory for Prior Grant Server \$23,000 Time and Materials ORACLE support		
<input type="checkbox"/>	Scanning	Describe			
<input type="checkbox"/>	Reports	Describe			
<input type="checkbox"/>	Development	Describe			
<input checked="" type="checkbox"/>	Other Assistance	Describe	\$20,000 Education and Training for 1 year for A&T		
<input checked="" type="checkbox"/>	Other Deliverable	Describe	\$16,000 Base Map Polygon creation \$30,000 Interoperability and adjustments to Data Model		
b. Timeline (funding not to exceed 1 year from contract date)					
All items are for 1 year or less.					<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Costs of total project					
Multnomah County provides A&T Cartography staff time, GIS Coordination, Oracle DBA support, UNIX hardware and Oracle software in support of this project. These additional costs are difficult to quantify, but are vital to project success.					<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Partnerships and contributions:					
County Survey is providing GPS control. Goal 2 data and Survey GIS data are integrated into http://gis.co.multnomah.or.us/sail application to locate and view surveys and assessor maps online. Intergraph has awarded Multnomah County a \$55,000 Open Interoperability Grant for GIS web services.					
e. How does this help ORMAP Goals 1, 2, 3, or 4:					<input type="checkbox"/> Yes <input type="checkbox"/> No
Transforms Goal 2 data into Goal 3-4 and creates Base Map Polygons.					

f. Benefits to Users:		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Long-term reliable maintenance in a flexible and powerful GIS environment that preserves the existing investment of high quality CAD data.			
g. Promotes Partnerships:		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Internally, Multnomah County has formed cooperative partnerships between GIS, Survey and Assessment and Taxation. This positive supportive environment is invaluable and mutually beneficial. All mapping done under ORMAPP will be provided to Metro for regional publication as part of the RLIS GIS CD. This request extends our ability to provide base map data to internally and to external utilities, local governments and other jurisdictions that can be customized temporally, geographically and by desired vendor format.			
h. Innovation:		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Use of Oracle native spatial database supports an Interoperable Data Model that is not restricted to specific vendor software. Use of Oracle Transaction Manager supports native archiving of “snapshot-in-time” of map data.			
i. Assessor’s Signature:			
Project Contact – Name:	Andrea Westersund	e-mail:	Andrea.i.westersund@co.multnomah.or.us
Title and Phone Number:	Senior DBA (503)988-3749 x22217		
Mailing Address:	501 SE Hawthorne Blvd, Suite 400 Portland, OR 97214		

Section III. Detail Project Information – All questions must be answered

A. Overview

1. Describe what the project is trying to accomplish
Continue support of Multnomah County strategy to meet goals 3-4. Moves from a “GIS Ready” stage towards maintenance of Assessor Map data in a GIS environment.

2. Does this project relate to any previous ORMAP funded project? If yes, please explain
Yes, uses outcomes of previous projects, aerial photos, common county boundary, a strategic plan developed by consultant, software and training purchases.

3. What is the status/outcome of the previous ORMAP funded projects?
All previous ORMAP funded projects have been successfully completed with the exception of the latest grant from Spring 2003. We are just beginning the Spring 2003 grant funded data model process which needs to be completed before subsequent tasks are started. The Spring 2003 Grant also supported Goal 2 completion, and the status is summarized below. To reach Goal 4, the same data set will be used after conversion to a GIS environment, edgematched and moved to better control as needed.

GOAL 2 Progress 2/26/04	Townships	% Townships	Maps	% Maps	Master Taxlots	%Master Taxlots
Completed	21	91%	2,316	60.8%	136,779	56%
To Do	2	9%	1,494	39.2%	106,921	44%
Total	23	100%	3,810	100.00%	243,700	100%

B. Project Design-Current Proposal

1. Identify the ORMAP and the regional/county goal(s) that this project addresses.
Goals 3-4

2. Describe in detail your technical approach to the project.
Multnomah County currently maintains 100% of our Assessor maps in digital form. Four A&T Cartographers support a high volume of map maintenance using Bentley's Microstation and some Intergraph MGE products. The maps are stored as files with levels of information within a specific map rather than as seamless GIS style themes over the entire county. Without editing and manipulation, the linework does not consistently generate closed polygons from the taxlot levels. There is no centroid to identify the polygons. Linework that is suppose to be identical at the edges of files, is not maintained consistently, and may overlap or gap somewhat at file edges. On paper, Multnomah County has extremely high quality maps. As GIS data, however, creating taxlot polygons or other polygons from the CAD files requires much effort.

To accurately and effectively create and maintain 240,000 taxlots with the volume of changes that we experience, we believe A&T Cartography must have the tools to not only maintain Assessor maps but also the taxlots polygons within the maintenance process. A strategy that provides development of polygons outside the A&T Cartography process will always be out of date and without methods to measure quality.

Our strategy gradually moves Cartography from a CAD maintenance environment into a GIS-based maintenance environment, moving from maintaining thousands of map files to maintaining a single, seamless intelligent integrated GIS database. We place high priority on retaining our investment in the integrity and relative correctness of the existing data.

Project Design

While we had completed some preliminary pilot projects, before committing to a particular conversion strategy, we felt very strongly that we needed the advice of a professional consultant to recommend an overall strategy. With ORMAP funding, we hired PlanGraphics to provide recommendations about an overall strategy. The consultant surveyed users of currently released GIS software products and determined the most productive tools within the constraints of a small staff and budget.

The basic recommendations are:

1. Clean existing CAD Data within CAD environment.
2. Provide GIS Education to staff, starting with leads.
3. Recommended Intergraph's GeoMedia Pro and GeoMedia Parcel software products.
4. Design and Implement a long-term Relational Geodatabase to support seamless GIS data model.
5. Develop automated maintenance routines to assure consistent processing.
6. Conduct a Countywide GIS Needs Assessment.

Our successful experience with the new software tools to create GOAL 2 polygons has developed a sound base to move with confidence into GOAL 3-4 development. We are now developing the data model needed as a foundation for the maintenance environment.

The existing hardware/software platform is:

- Enterprise Oracle on UNIX with distinct Development, QA/QC and Production environments
- County IT Oracle DBA support
- GeoMedia Pro, Parcel and Transaction Manager in Windows XP

Need to Convert CAD to GIS Base Features

Unlike some counties, our GOAL 2 data provides the base to move to GOAL 3-4. The basic strategy is to append additional lines to GOAL 2 boundaries to create larger polygons.

The next tasks in order of priority are:

- 1) Edge match files by GOAL 2 polygons
- 2) Develop map boundary polygons
- 3) Develop Levy Code Polygons
From Levy Code Polygons derive jurisdictional boundaries
- 4) Develop Control Polygons
Develop qtr-qtr, qtr, and section polygons as they exist in maps. Derive larger polygons from smaller, when appropriate.
From section polygons derive township polygons
From section corners intersections, place section points
Develop DLC polygons
Develop Government Lot Polygons
Develop County Boundary Polygon
- 5) Develop the "not" taxlot polygons as determined by the data model. These are anticipated to be road ROW polygons, railroad ROW polygons, water feature polygons, and transmission line polygons. When these polygons are in place, every space within the county will be covered by a non-overlapping polygon at the ground level.
- 6) Develop Plat and Partition Plat polygons

Future tasks may include creation of easement, lot/block polygons, and other smaller polygon features, but at this time, these features will be represented simply by lines.

Need for Interoperability

The existing CAD files are used internally and by area partners. Through Oracle, we can allow access of the same database from ESRI ArcGIS, MapInfo and Intergraph GeoMedia clients. Many technologies allow standards compliant functions and non-standards compliant functions. To assure interoperability capability exists throughout and is an FGDC compliant data model, we are proposing an independent data model review from a consultant that has successfully implemented interoperable environments. This process will also import our 2 pilot sections of CAD into the data model for detailed examination of the results. Consideration of external needs, including ORMAP are included.

Need for ORACLE Support on Time and Materials Basis

We are also asking for a time and materials contract to handle complex technical issues with Oracle/Intergraph interface that our county staff encounters in the next 9 months.

Need for Continuing Education and Training

To develop GIS skills, education and training opportunities must be available to A&T Cartographers over the next 12 months.

Need for Additional Server Memory to Support Web Interface into GOAL 2 Data

In Multnomah County, the GOAL 2 results of the ORMAP project allow A&T to see a direct connection between the Assessor's data and the Assessor Map. Often that connection exposes tabular data errors in the Assessor data base, or annotation errors on the Assessor Map. The identification and correction of these types of discrepancies is encouraged and should be made available first internally within A&T before the data is publicly available.

Multnomah County received an Intergraph Interoperability grant of software that will enable access to the ORMAP GOAL 2 data through a browser interface. Multnomah County applied for and received the standard \$5000 server grant to support the software on our Intranet. The \$5000 allowance does not quite support a server configuration that handles the high volume of taxlots or the internal requirements for servers by our IT department for mirrored hard drives. We deleted certain items to stay within the \$5000 budget (the total invoice was \$5300). We are now asking for an additional \$1500 to increase server memory and to make up the \$300 overrun.

3. Describe the project deliverables. Please keep in mind these deliverables are to be billed against when submitting requests for payment to the Department of Revenue.
 - 1) Edge Matched GOAL 2 taxlot polygons for all of Multnomah County.
 - 2) The process to create other CAD to GIS Base Map polygons. Test on 2 section pilot areas. Develop conversion strategy and proceed.
 - 3) Interoperability study. Potential revisions to data model identified and corrected. Implement data model in ORACLE.
 - 4) Time and Materials support of Oracle for DBA for 9 months.
 - 5) GIS Education and Training for A&T staff for 1 year.
 - 6) 1 GB memory module for Web Server for A&T that would have exceeded \$5000 max.
4. Will this proposal fund staff that are doing work other than work funded to do ORMAP work? If so, describe how the time and cost will be tracked for the different projects. ORMAP work and normal Assessor Map maintenance are merged in our county.
5. Describe the maintenance plan for this product. Maintenance will be part of A&T Cartography work flow.

6. Describe how this project conforms to the ORMAP Exchange Data Standards? Shapefiles and data as documented for GOALS 2-4 can and will be created.

C. Project Outline/Work Plan/Calendar/Costs-Overall multiyear project

1. Describe where this project fits within the county's overall Mapping/GIS system plan. Refer to Multnomah County Strategy, Updated February 2004. This project moves Multnomah County from Stage 1 creating GOAL 2 polygons, to Stage 2 where GOAL 2 polygons are adjusted and used to create other related polygons. The maintenance environment shifts to a single seamless GIS database.

At Stage 1, we are able to create Goal 2 polygons, but maintenance of the polygons becomes more and more labor intensive. With Stage 2, we will create and maintain Goal 4 polygons by using or improving the current CAD data and moving into a GIS maintenance environment.

2. Show a project timeline with milestones and with phase completion date(s) identified.
2003-2004

Develop and maintain GOAL 2 taxlot polygons

56% complete July 2002 – October 2004

Work is done by Multnomah County staff in addition to regular duties. To assure that we meet the October 2004 schedule, we will use ORMAP funds for voluntary overtime as needed from a previous grant.

TO DO-- Format GOAL 2 ORMAP attributes for publication
Estimated time: 20 hours

Design seamless GIS maintenance environment

June 2003 – October 2004

Develop Data Model for GeoMedia and Oracle
v Consultant Hired, First on site visit completed 2/24/04
Model to be completed by April 30, 2004

Develop Interoperability Plan to use or provide data in various GIS vendor environments for Internal and External uses.

Develop Data Conversion Plan and Convert Data in Pilot Areas
Develop and implement procedure to edgematch taxlots by file
Develop and implement plan to create aggregate polygons (levy codes, subdivision, etc.)
Develop and implement plan to import text and cartographic elements
Develop Strategy to Align County Boundaries
Develop Strategy to Adjust to GPS Control if needed
Initiate conversion as the results of the above work indicate.

Milestones

October 2004 ***ORMAP GOAL 2 Delivery Date***

3. Give a breakdown of costs for the major tasks and the total costs for each fiscal year.

Spans FY 2003 -2004 and FY 2004 -2005

Base Map Polygon Creation	\$16,000
Time and Materials ORACLE support (9 months)	\$23,000
Interoperability and Adjustments to Model	\$30,000
Education and Training for 1 year for A&T	\$20,000
Additional Memory Module (part of OS)	\$ <u>1,500</u>
TOTAL	\$90,500

Under Multnomah County purchasing and contracting procedures, contracts are awarded in an open bidding process. Specific costs are not available until this process occurs and the contractor selected.

D. Quality Control

1. Who will be responsible for quality control?

Multnomah County GIS will run quality control checks for GIS data.

Multnomah County A&T Cartography will correct Assessor map data.

2. What will be the procedures for quality control?

GIS queries will be used as tools for polygon and attribute quality control. Edge matching issues can be detected automatically. Comparison of polygons to the attribute tables allow for error detection.

E. Data Availability

1. Identify any restrictions on data sharing or licensing issues with this product.

Multnomah County retains the right to withhold data from ORMAP if Multnomah County policies conflict with ORMAP specifications.

F. Background Information

Attached County/Regional current Business Plan—if one is not on file

Regional Plan is On File. Updated County Plan, February 2004.

G. Other Issues - Please identify.

ORMAP REGIONAL GRANT AUTHORIZATION 2004

The _____R-MAP_____ Region approves funding to __Multnomah__County from the ORMAP Regional funds in the amount of \$____90,500____ for the ORMAP project.

Regional Coordinator (signature)

Name____Andrea Westersund_____

Address__501 SE Hawthorne_____

Portland, OR 97214_____

Phone (503) 988-3749 x22217_____

ORMAP Grant Application – Addendum

Request for Additional Information

2004 Spring/Fall Request

Fill only if requested.

The information provided in Sections I and II should not exceed more than two pages

Section I. County and Grant Information		
a. County/Region	b. Grant Request (Only the amount for the funding type selected in Section I.c)	c. Type of Funding (Check only one)
Multnomah	<input checked="" type="checkbox"/> Regional <input type="checkbox"/> Discretionary <input type="checkbox"/> Combination (For grants requesting both types of funds in one project)	Discretionary Fund Request \$90,500.00 Regional Fund Request \$77,600.00
Section II. Project – Additional Information		Official Use Tech Group Assessment
a. What percentage of ORACLE support will come from sources other than ORMAP?		<input type="checkbox"/> Yes <input type="checkbox"/> No
<p>After examining alternatives, Multnomah County has selected ORACLE as the foundation of our A&T Cartography data. ORACLE is a Multnomah County standard for Enterprise data. Our ORMAP data will be stored and managed with the other Enterprise systems such as SAP, data warehousing applications, etc. This strategy allows Multnomah County to leverage the ORMAP project data for internal and external use by a variety of software, not limited to GIS specific packages, through ORACLE database standards.</p> <p>An alternative strategy that separates the ORMAP project in a stand-alone environment would require support of all of the following functions, not only for initial purchase, but also for long-term support. Multnomah County no longer allows a department to support their own servers. Servers and software must meet county IT standards. NOTE: Other infrastructures can support ORACLE. Current ORACLE licensing for dual-processor Windows server is about \$5,000.</p> <p>HARDWARE and OPERATING SYSTEM: 100% County paid. (Rough estimate \$200K) The development and test GIS databases reside on a Sun Fire 280R server with 2 CPUs and 4GB memory. The future production GIS database will reside on a Sun Fire V880 with 2 CPUs and 4GB memory. Both servers are connected to a SAN and each has 57GB of available database storage. Total GIS SAN disk space is projected to be approx 20GB.</p> <p>ORACLE: 100% County paid (best avail info. \$56K license, \$12K annual maint.) License and maintenance for both machines.</p> <p>PERSONNEL SUPPORT HOURS: 100% County paid. (Rough, rough estimate \$200K) Technical support staff for backups, networking, etc. 24x7 support. DBA staff includes several experienced ORACLE DBAs.</p> <p>Up to this point, ORMAP has contributed \$0 to our ORACLE database infrastructure. Of the total infrastructure, a rough estimate is that GIS will use 10%-15% of the above resources.</p>		

b. What specific type of ORACLE is the county looking for assistance with?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p>The spatial component (called Locator) is now a standard part of ORACLE, starting with ORACLE version 9i. Management of spatial data is new to our DBAs. We have successful installed, configured and are using ORACLE 9i with GeoMedia for development of the simple Goal 2 polygons. Implementation of the Goal 4 production A&T Cartography data model is more complex. Understanding how ORACLE can efficiently support this application is key to success. We need initial training of lead personnel on how ORACLE and GeoMedia work together (more details in Question c).</p> <p>Because the spatial component is new to us, we also need a way to efficiently work through potential complex production data model implementation issues. Because our legacy CAD data is so variable, we may run into roadblocks that our initial training and normal ORACLE or GeoMedia support does not cover. Such circumstances would also be impacting A&T Cartography staff's ability to meet their normal production capacity. Potentially, data could be damaged and our ability to meet ORMAP goals compromised. Our solution is a "time and materials" contract that supports access to expertise, only when needed for the next 9 months. The contract supports online access to our system as well as in-person site visits, if needed. We view it as the best kind of insurance policy (no cost if not used) to manage the risk of migration of Multnomah County's and DOR's \$10 million investment in our A&T Cartography data into ORACLE.</p> <p>The proposed time and materials contract is for a maximum of 120 hours at \$190 per hour over the next nine months, at a cost of \$22,800 specifically for the services of Chuck Woodbury at Intergraph. Our internal contracting process adds overhead so the request is for \$23,000. Again, we pay only for the hours we use. We will request this assistance only when other support avenues have not succeeded in solving the problem and we are wasting county dollars supporting labor "spinning their wheels" to find a solution to implement GOAL 4. We have solicited 3 quotes for alternative vendors and proposals following county purchasing policy.</p>	
c. What specific training is being requested by this grant? Please list classes and the positions who will receive the training.	<input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> • \$1100 estimate 2 days Onsite custom Advanced Oracle Locator (for GeoMedia) training est. \$6,560 (previous ORMAP grant covers 5,508) Patty Bowser (Oracle DBA), Andrea Westersund (GIS), Rich Richardson (A&T Cartographer). Other staff may attend. • \$3,500 estimate 5 day onsite GeoMedia Training 5 A&T Cartography staff (up to 5 others) • \$2,500 estimate 3 day onsite Parcel Manager with Multnomah County DataModel 5 A&T Cartography staff (up to 5 others) • \$3500 estimate GIS and CAMA National Conference & Training Opportunity 1 person from County Assessor or Appraisors department • \$5900 estimate Intergraph National Graphic User Group Present Paper on ORMAP Project, Training Opportunity 2 people from A&T Cartography ORMAP Project Team • \$3500 Local Training (eg, GIS in Action, local Intergraph User Group events, etc) A&T Cartography staff (up to 5), Assessment staff (up to 2) (\$500 per person) <p>TOTAL \$20,000 for 12 months</p>	
<p>We feel all counties should have an education and training plan to help staff use GIS technology effectively and derive value and cost savings from its use. GOAL 4 "supports a broad array of public and private GIS applications". We must prepare to do this. Education and Training was</p>	

identified by DOR as an issue (Road Trip Issues Winter2004 Grapevine).	
<p><i>d.</i> Approach the other GeoMedia user group members to determine if this data modeling effort is the only Geomedia production data model being funded by ORMAP? If not what circumstances exists that warrant multiple GeoMedia production data model efforts?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p>Multnomah County’s data modeling effort is an ORACLE based solution, not specifically a GeoMedia based solution. The A&T data that is maintained through GeoMedia in ORACLE, and can be read by other software, including ESRI ArcGIS, AutoCAD, MapInfo, and others that implement the ORACLE interface. Multnomah County hosted a seminar on ORACLE and Interoperability by Gary Zhang, President of MRF GeoSystems, on January 21st and had many ORMAP participants. (MRF donated services.) Multnomah County will share our knowledge of ORACLE and our data model strategy for A&T Goal 4 implementation with anyone.</p> <p>No other county that uses GeoMedia has requested funding for a data model. Counties that use GeoMedia are storing their A&T Assessor Map data in a relational database and in the future, may need to develop more complex data models to support specific production needs. GeoMedia software works natively with a number of standard databases including Access, SqlServer and Oracle. It is the capabilities of the database, the size of the county’s A&T data, the capabilities of a county to support a particular database, the Assessor Map Production processes particular to a county, and the desire to integrate GIS into the enterprise (or not) that determines a particular strategy. A production data model is a physical implementation that is typically county specific. A publication data model can be standardized. We recognize a need to develop an ORMAP publication data model if ORMAP intends to share more data in GIS format than the current data standards support through shape files.</p> <p>There is no official ORMAP GeoMedia user group. Intergraph hosted an adhoc GeoMedia Users Group on December 10th at the DOR Field Office. The audience included ORMAP members as well as utilities, ODOT, etc.</p> <p>We decided to encourage Intergraph to continue hosting GeoMedia Users Groups in the Northwest. Intergraph will be formally creating the user group by their own internal process. Educational training opportunities were provided at the December 10th meeting and will continue to be provided through these forums.</p> <p>ORMAP GeoMedia users that were present met informally after the December 10th meeting. I contacted Umatilla County, who could not attend, by phone so I could respond to this question. We all agreed:</p> <ol style="list-style-type: none"> 1 GeoMedia already works well for A&T Assessor mapping and to meet ORMAP Goal 4. Future enhancements, developed by Intergraph and already prioritized by their existing product development process according to user needs, will make the product even better. 2 We do not share the ESRI User Group’s immediate need to develop custom “macros” to provide basic capabilities necessary to meet GOAL 4. 3 We can share tools and techniques informally. There are online GeoMedia user group forums in place that already work well to answer questions from users around the world. 4 Logistically it is difficult to meet in person and often travel costs are a barrier. ORMAP could decide to allocate dedicated and limited funds from ORMAP to each county to assist with travel costs. County funds are typically not available, especially in these budget crunch times. 	