Metro

Growth Management Services Department

RLIS Data: Customer Survey and Implications

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A Report by the Office of the Auditor

METRO

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REGIONAL SERVICES

METRO

OFFICE OF THE AUDITOR

September 9, 1997

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Re: RLIS Data: Customer Survey and Implications

We reviewed programs for selling Metro data to other organizations through the Data Resource Center's Subscription and Storefront programs. The Regional Land Information System (RLIS) data are important to the land management functions of Metro, its local government partners, and Storefront Program customers.

As part of our annual audit plan, we conducted the first-ever assessment of how local government and private-sector purchasers rate the usefulness of the information available through RLIS. We determined their views and related information through a customer satisfaction survey which we distributed to all RLIS users who purchased the products over the past two years. In follow-up interviews with respondents, we obtained insights into how RLIS products might be improved for local government and private-sector use. Our review also provided some insights into how respondents' experience with RLIS data affected their perception of the data's accuracy for Metro's regional planning purposes.

We reviewed a draft report with the Executive Officer, the director of the Growth Management Services Department and his staff. The written response of Executive Officer Burton is included in the report.

We appreciate the cooperation and assistance provided by staff from the Growth Management Services Department.

Very truly yours,

Alexis Dow, CPA
Metro Auditor

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Executive Summary

Metro's Regional Land Information System (RLIS), a computer mapping system, has over 100 overlays that can spatially depict a variety of data for a geographical area, including land uses, transportation routes, zoning codes, urban development patterns, and natural resources. RLIS is administered by Metro's Data Resource Center (DRC), a division of its Growth Management Services Department. The DRC enjoys a reputation as one of the preeminent regional geographic information system (GIS) programs in the world.

Metro uses these maps and databases for its own planning purposes, but it also makes them available to its partner governments through a subscription program and to businesses and others through the Storefront Program. According to Metro management, sales of RLIS products for fiscal years 1993 through 1997 to local governments and storefront customers totaled $1.3 million with costs of about $1.2 million.

We determined how local government and private-sector purchasers rate the usability of the information available through RLIS with a customer satisfaction survey. In follow-up interviews with survey respondents, we sought insights into how RLIS products might be improved for local government and private-sector use. Our review also provided some insights into how respondents' experience with RLIS data affected their perception of the data's accuracy for Metro's regional planning purposes. Most survey respondents worked in government, real estate, consulting, engineering and architecture. They used RLIS for planning, real estate development and construction, and a variety of other applications.

- **Degree of customer satisfaction.** Buyers of RLIS products have widely divergent opinions as to how satisfied they are with Metro data. Although the average user satisfaction rates for products are generally high, some users give low marks. A number of users commented that the RLIS information was

either not sufficiently detailed for their use or was out of date, incomplete, or inaccurate. Many of them still regarded the data as a good starting point, but some expressed overall disappointment with products Metro sold to them. In some cases, customers' expectations are too high and do not take into account warnings in the purchase agreement and the DRC catalog about the age, source, and level of detail or accuracy of the data. Despite the warnings, many customers still purchased RLIS products that did not meet their needs. This has resulted in dissatisfaction and lack of trust and confidence in Metro's ability to provide accurate and useful data.

- **Lessons for customer relations.** DRC needs to develop a plan for improving the accuracy, level of detail, and timeliness of the RLIS information to make it more useful to local government subscribers and Storefront customers. DRC can also explore a number of other ways (contained in recommendations at the end of this report) to help ensure greater satisfaction among external customers and perhaps expand the sale of RLIS products. However, there are probably limitations in how far Metro can go in satisfying some users' needs for absolute accuracy and up-to-the-minute information. Such requirements outstrip the system's current ability. Thus, we believe that one necessary action is for DRC to redouble its efforts to explain the limitations of the RLIS products to potential customers in order to avoid the customer dissatisfaction that we found.

- **Lessons for future marketing directions.** When the Storefront Program was first proposed, a consulting firm studying the feasibility of marketing GIS products recommended that Metro market these products on its own initially but then move aggressively toward privatization. The rationale for this recommendation rested in part on the view that the private sector, not Metro, had the necessary resources to develop the more specialized GIS applications that customers were likely to need. As one way of addressing this issue, Metro should continue to explore selling the information to "value-added resellers" — firms that will augment or refine the data in ways that make the

information more valuable to customers that are not satisfied with what they now receive. Doing so would allow DRC to concentrate on its central mission of serving Metro's in-house planners.

- **Lessons for Metro's decision-making.** The RLIS data are an essential part of Metro's regional planning activities. Metro management believes the data meet the accuracy requirements of a broad-scale land information system. However, when the local government subscribers and the Storefront customers for the RLIS products and services find the kinds of errors, omissions, and out-of-date information they reported in our user satisfaction survey, it causes them to question the soundness of the data Metro uses in it's large-scale planning activities. In order to improve the customers' perceptions of Metro data quality, Metro needs to determine what they can do to improve the data, and what changes in their operations or additional resources might be needed to achieve the improvements.

Chapter 1. Introduction

Metro's primary responsibility is land-use and transportation planning in urban portions of Clackamas, Multnomah, and Washington counties. Metro works with the 3 counties and 24 cities within its boundaries to maintain and enhance the livability and economic viability of the region. Metro's Growth Management Services Department conducts land-use planning. Through the department, Metro manages the region's Urban Growth Boundary, the primary urban growth management tool mandated by state land-use planning laws.

Metro and local government officials, as well as private sector users, need information such as boundaries, census geography and data, environmental designations, developed and undeveloped lands, tax lots, and transportation availability for their work. In order to meet the need for information, Metro's Data Resource Center (DRC), part of the Growth Management Services Department, provides technical information and services to Metro departments, jurisdictions in the region, the general public and private sector businesses. DRC maintains a large amount of information about the Portland metropolitan area's land, population, and economy. This information is contained in the Regional Land Information System (RLIS), a computer mapping system that can spatially depict many types of data for large or small geographic areas. Such data include land-use records, property tax data, transportation routes, zoning codes, urban development patterns, and natural resource information. The RLIS program was approved by the Metro Council in 1988 and became operational in 1990.

The DRC and its RLIS system enjoy a reputation as one of the preeminent regional geographic information system (GIS) programs in the world. DRC recently received the Environmental Systems Research Institute's President's trophy for an exemplary GIS program. This institute is the largest GIS vendor in the world.

History and Description of RLIS Products

Metro uses RLIS for its own planning efforts, but RLIS information is also available to local jurisdictions by subscription. State law allows Metro to charge market-based fees for RLIS data and to use the fees collected to maintain the databases and provide services to customers. In RLIS' early years, local jurisdictions were required to contribute dues to Metro supporting regional planning and coordination activities. A portion of these dues helped support the RLIS program. Since adoption of the Metro Charter in 1992, the dues have been replaced with a voluntary subscription program for local governments based on a 10 cents per capita fee. As of FY 1996-97, 17 of the 27 cities and counties within the region, representing 98 percent of the region's population, were RLIS subscribers.

RLIS data are also used by businesses, non-member governments, nonprofit agencies, and the public. The Storefront Program was developed in response to a consultant's report that identified significant demand for RLIS products and services among non-member governments, nonprofit agencies, and businesses. One reason for the program was to allow for Metro to recoup some of RLIS's $774,000 in program development costs from users of the products not involved in the initial investment and database development.

Metro's RLIS products are sold in hard copy and digital forms. In most cases, the products can layer one or a combination of more than one hundred data layers of specific types of information. Examples of RLIS hard copy products include:

- Maps of boundaries, zoning requirements, and roads;
- Vacant land atlases for residential and commercial areas;[1]
- Demographic data for region-wide or site-specific areas; and

[1] The Vacant Lands Atlas is an aid to locating sites for residential or commercial and industrial uses. The Vacant Lands Atlas includes many layers, including: taxlots (e.g., size, owner), undeveloped land, zoning, city and county boundaries, national wetlands inventory, urban growth boundary, and steep slopes.

- Environmental information such as flood plains, and slopes.

Custom products such as reports and maps that effectively combine and overlay demographic or geographic data for site-specific areas are also available.

Computerized RLIS products include CD-ROM sets detailing a variety of geographic and demographic data for each of three counties in the Metro area. For example, the "RLIS Lite" CD-ROM contains many data layers, including taxlot lines and related assessor records (e.g., value, size, owner and sales value), streets, zoning, city and county boundaries, rivers, watersheds, wetlands, urban growth boundary, census tracts, and others. Metro's listing of RLIS products and prices is shown in Appendix A.

In selling data to those outside Metro, DRC cautions buyers about limitations in the information they are purchasing. Metro's product purchase agreement states, "Metro's RLIS data is collected from the region's 24 cities and three counties for general planning purposes and Metro therefore does not warrant the accuracy of data originated by these jurisdictions. Metro has collected and is maintaining these data to meet the accuracy requirements of a broad-scale land information system. Therefore, the level of accuracy is deemed adequate for regional planning purposes." In addition, the DRC catalog lists limitations for many of the products in regard to age, source of the data, and level of detail or accuracy.

Objectives, Scope and Methodology

As part of our annual audit plan, we assessed how local government and private-sector purchasers rate the usefulness of the information available through RLIS. We undertook this review to assess the level of satisfaction of subscribers and storefront customers with the products and services and to determine what improvements Metro might make to better meet customer needs. We also wanted to assess the level of public and private sector satisfaction with RLIS products in view of the Executive Officer's and Metro Council's goal of broadening the Subscription Program base and expanding sales of products and services.

In order to determine RLIS users' perceptions of the accuracy and quality of the RLIS products and their level of satisfaction with the products, we developed a user satisfaction questionnaire. We employed a technical services consultant (Riley Research Associates) for assistance. Metro's DRC also provided questionnaire input and background information. The DRC provided us with a list of those who had purchased RLIS products between January 1,1995 and November 18,1996. After determining that the list contained actual users of RLIS products and their willingness to complete a questionnaire, the questionnaire was pre-tested. After minor changes, we mailed the questionnaire in February 1997.

From among the original mailing of 337, we received 196 completed questionnaires through March 26, 1997. According to Riley Research Associates, our 58 percent response rate is considered excellent and highly representative of the target audience. A copy of our RLIS User Survey questionnaire is shown in Appendix B.

We did follow-up interviews with selected questionnaire respondents to obtain more detailed information on the product ratings and comments they made. We examined maps and other documents the respondents provided to help explain their comments. In addition, we reviewed relevant state laws, the Metro Charter, the Metro Code, Metro Council directives, and other Metro documents and reports, including budget and financial information and DRC documents that pertained to RLIS. We also interviewed individuals in the Growth Management Services Department and other Metro officials.

The audit was done in accordance with generally accepted government auditing standards. Field work took place between October 1996 and August 1997.

Chapter 2. RLIS Data Sales: Current Sales Levels and Potential Future Developments

Overview

DRC reported that sales of RLIS products and services during fiscal years 1993-1997 exceeded $1.3 million. DRC spent about $1.2 million to respond to purchasers' requests. The remaining moneys collected from the sales offset part of the $774,000 in program development costs. When the feasibility of the Storefront Program was initially studied, consultants recommended that Metro initially sell the information directly but later privatize the sales effort. Metro's recent sales plan, completed in December 1996, begins to move in this direction.

Sales Exceed $1.3 Million Over 5 Years

The sales of RLIS products and services have exceeded $1.3 million for fiscal years 1993 through 1997 with costs of about $1.2 million, according to figures provided by DRC. Of this total, about $767,000 (58%) was from sales to member governments through the Subscription Program. Subscriptions for Metro's local government partners are based on a subscription fee of 10 cents per capita. Seventeen of the twenty-seven cities and counties within the region were subscribers to RLIS in fiscal year 1996-1997. These 17 governments have 98% of the region's population. The remaining $542,000 was from sales to businesses, non-member governments, and others through the Storefront Program. These revenues increased substantially in fiscal year 1997, helped by a catalog of products and services and a sales brochure. DRC expects the Storefront Program to serve about 350 customers and fill over 600 work orders by the end of the fiscal year.

Table 1-1. Metro subscription and storefront revenues, fiscal years 1993 - 1997 (in thousands of dollars).

	FY 92-93	FY 93-94	FY 94-95	FY 95-96	FY 96-97	Total
Subscription	184	165	134	122	162	767
Storefront	68	82	97	99	196	542
Total	252	247	231	221	358	1,309

Consultant's Original Feasibility Study Called for Eventual Move to Privatization

The direction of sales plans seems to be in agreement with some of the findings in the 1991 GIS Marketing and Distribution Study that a consultant, Ernst & Young, did for Metro. That study called for Metro to directly distribute the RLIS products and services to customers in its early, formative years, as a short pilot study, and then to move aggressively toward privatization. The Report recommended that Metro move to privatization for the following reasons:

- The private sector can devote the necessary resources to developing markets for RLIS products and services.
- The private sector has a strong profit motive in distributing RLIS, whereas Metro may not compete with existing vendors.
- The private sector is potentially more knowledgeable about possible specific applications of RLIS.
- The private sector has more experience with distribution to the private sector than does government.

Metro's Recent Sales Plan Calls for Considering Greater Use of Value-Added Resellers

In December 1996, the DRC staff completed a business plan that has elements that respond to the Ernst & Young study. The plan, which provides direction and focus for the products and services to be provided by DRC's Subscription and Storefront operations, makes it clear that DRC's primary focus is to meet the needs of Metro's in-house planners in each of the departments. The plan states that it is confronting the unique challenge of creating a model that will maximize revenue within government, while maintaining a high level of service and commitment to Metro's programs. It states that a central issue is therefore "to avoid diverting DRC staff from their central mission in their zeal to generate revenue." The plan points out that the DRC has three client groups.

1. The top priority, or core clients, are Metro's planners in each of the departments. They are the DRC's reason for existence.
2. The second priority are Metro's regional partners, the subscribing governments.
3. The third priority are the Storefront Program customers who are the business and public users of DRC products and services.

The business plan discusses some trends that may impact future sales of RLIS products. One is the development of GIS programs by several local jurisdictions. In addition, the declining costs of GIS software and the increasing use by private firms has made the demand for GIS products and services grow rapidly. This increased demand could create more scrutiny and dependency on RLIS and an increased expectation for timeliness and accuracy of the databases, according to the business plan. The plan predicts that Subscription Program revenues will decline over time as local governments develop their own GIS capabilities.

The Ernst & Young recommendation to privatize the distribution of RLIS products and services fits well with the issues raised in the DRC business plan. The plan acknowledges that the DRC has a unique challenge to increase revenue from sales of products and services to outside users, while continuing to meet the central mission of serving Metro's planners. One way to meet the challenge is to use value-added resellers (VARs) to develop new products, market them, and provide customer support. This could provide a way to increase sales and better meet the unique needs of private sector, and in some cases, local government users with a minimum diversion of DRC staff from their central mission. The business plan discusses an increase in the use of VARs who pay royalties to Metro and include RLIS data in the products they sell. Metro currently has a contract with one VAR using RLIS data. The plan states that as VARs expand their product offerings, DRC can offer fewer niche-focused products. In interviews, DRC staff said they see their role as more of a data seller, with development of new products, marketing, and customer support as the proper role of private sector businesses. They also envision DRC doing fewer fee-for-service custom-type products because that type of work does not produce significant profits and diverts resources from Metro's primary mission.

Metro's Role as Regional Data Provider is Evolving

Metro management told us that the RLIS program was developed with the following three-phase strategy that recognized an evolving role for Metro as a provider of a land information system for the region.

- Phase 1: Metro served as the initial developer of the regional GIS system and provided it to local jurisdictions when they were ready to invest in GIS and to agree to maintain the data for their jurisdiction.
- Phase 2: Metro is to shift from maintaining local GIS databases as local governments develop their own systems and take over system maintenance. This phase was also to include developing regional standards for data sharing and intergovernmental agreements about data structures, responsibilities, data accuracy, timeliness, and other matters.
- Phase 3: Metro will be the regional integrator of local GIS databases and place its effort on the standardization and dissemination of land information data.

Metro currently is straddling phases 2 and 3, according to Metro managers. Metro has intergovernmental agreements in place that describe the responsibility of each jurisdiction in the regional land information system.

Chapter 3. Results of RLIS User Survey

Overview

Organizations and individuals that purchase RLIS data through the subscriber and storefront programs are a diverse group, both in the types of RLIS products they purchase and the uses to which they apply the information. Most customers tend to be reasonably satisfied with the products they purchase. However, closer analysis of the results shows that some purchasers are considerably less pleased than others.

RLIS Users Have a Wide Variety of Applications

Our survey asked users who had purchased RLIS products to list the ways in which they used RLIS data and to rank their various applications according to how frequently they were used. Most of the 196 survey respondents said they used RLIS data in multiple ways. Twenty-four percent (46 of 196 respondents) listed municipal and urban planning as their most frequent application (see table 3-1). Taking respondents' top five uses into account, rather than just their most frequently used application, municipal and urban planning was again the leading use, with 61% of the respondents (119 of 196) listing it as among their top five. Transportation planning, environmental planning, public services and utilities, and real estate development and construction rounded out the overall top five.

Table 3-1. Survey Respondents' Most Frequent Uses of RLIS Data, by Rank Order

Overall Rank	Application	Rank Number One	Rank Top Five
1	Municipal and Urban Planning	46	119
2	Other (custom application)	37	60
3	Real Estate Development/Construction	29	62
4	Transportation Planning	22	81
5	Environmental Planning	13	71
6	Engineering	12	51
6	Public Services and Utilities	12	67
8	Right-of-way Planning	7	39
9	Education	6	38
10	Retail Matters	3	13
11	Value Added Resale	2	14

RLIS Users Represent a Wide Variety of Job Titles and Organizations

External users of RLIS products are a diverse group, both in the organizations where they work and the positions they hold. About 19% of the survey respondents listed planning as their job, with information systems/GIS, senior management, and engineering next at 15%, 11%, and 8%, respectively. The most frequently mentioned types of organizations represented by the survey respondents were local government (38%), consulting (16%), real estate development (6%), and, engineering/architecture, special service district, real estate sales, and state government (5% each). A more complete listing of job titles and organizations given by the survey respondents is shown in Appendix C.

Importance of RLIS Products to Users

The survey also asked the respondents to indicate the types of RLIS products they use and to rate the importance of the products on a scale of 1 to 3, with 1 = Not Important, 2 = Somewhat Important, and 3 = Very Important. Table 3-2 shows how each of the 18 products was rated by those who specifically used the product. Those who used the taxlot base gave it the highest importance rating, with an overall score of 2.71. All of the products were rated above "somewhat important" except for the MAGIC five-disk set,[2] which received a rating of 1.92 from the 39 respondents who rated it.

Usage is about equally split between hard-copy and digital products. About 39% use hard copy products exclusively, and the same percentage uses digital products exclusively. Similarly, among the remaining 22% who use both types of products, about half use hard-copy products most of the time, and about half use digital products most of the time.

[2] MAGIC is a five-disk set of custom software tools that simplifies access to the RLIS Lite data base.

Table 3-2. Respondents' Rankings of Importance of RLIS Products They Use

Rank	Product	Average Score*	Respondents Scoring Product
1	Taxlot base	2.71	92
2	Custom products	2.67	84
3	Pre-printed maps	2.66	117
4	Zoning & land use plans	2.65	89
5	Single line streets & addresses	2.62	84
6	RLIS Lite	2.56	87
7	Demographic data (hard copy)	2.54	96
8	Economic & employment data	2.53	87
9	Undeveloped land data	2.53	74
10	Vacant lands atlas (residential)	2.46	65
11	Environmental information	2.45	74
12	Demographic data (digital)	2.34	70
13	Environmental data	2.34	68
14	Pro Extension	2.30	44
15	Employment data	2.27	60
16	Vacant lands atlas (commercial)	2.26	61
17	Other	2.26	23
18	MAGIC	1.92	39

*1 = low, 3 = high score

Quality of Customer Services

For the most part, the survey respondents felt the DRC personnel were easy to work with in answering questions about the RLIS data. Eighty-eight percent of the survey respondents believed it was "easy" or "somewhat easy" to contact a Metro representative to get answers to their questions. Some had high praise for the work of individual DRC staff who had assisted them. However, some customers did believe they had problems with DRC in ordering and obtaining products they wanted.

RLIS Users Have Mixed Views on Products

Users had a wide range of views in their assessments of how good the products were. The survey asked users to evaluate products on the basis of four characteristics, as follows:

- General satisfaction
- Level of detail
- Fitness for use
- Coverage or map area

The survey asked users to rate each of these factors for each of the RLIS products they used on a scale of 1-10, in which 10 meant very good or satisfied, and 1 meant very poor or not at all satisfied.

For the most part, the scores most users assigned were in the upper end of the range (see figure 3-1). On average, users gave RLIS products a general satisfaction score of 7.2—about the same score they assigned to fitness for use (7.0) and level of detail (7.3). By comparison, the average score for coverage was higher (8.3). Appendix D shows the product-by-product ratings.

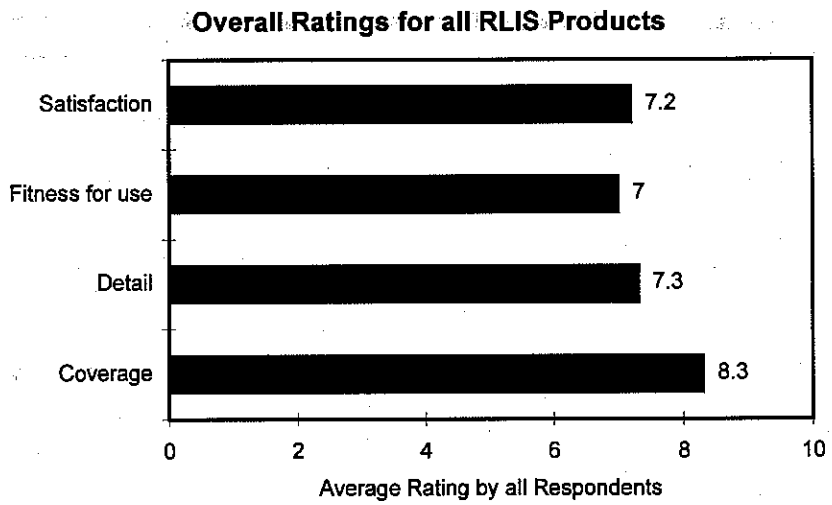

Figure 3-1. Respondents' overall ratings of four key characteristics of RLIS products.

Relying solely on averages, however, masks the considerable discontent that some users voiced in their ratings. Some products received consistently high ratings from nearly all users, while others had a noticeable minority of users that gave scores of 5 or less. Figure 3-2 compares the scoring distribution for the highest-rated product (custom products) and the lowest-rated product (residential vacant lands atlas). The two graphs show the number of users assigning each numerical score to the four characteristics. For example, the graph for the vacant lands atlas shows that seven respondents rated coverage as a 7 on the 1-10 scale, while four rated it as a 9. Custom products had very few users who assigned scores below 5 on any of the four characteristics. By

contrast, the vacant lands atlas received a much greater portion of scores that were below 5.

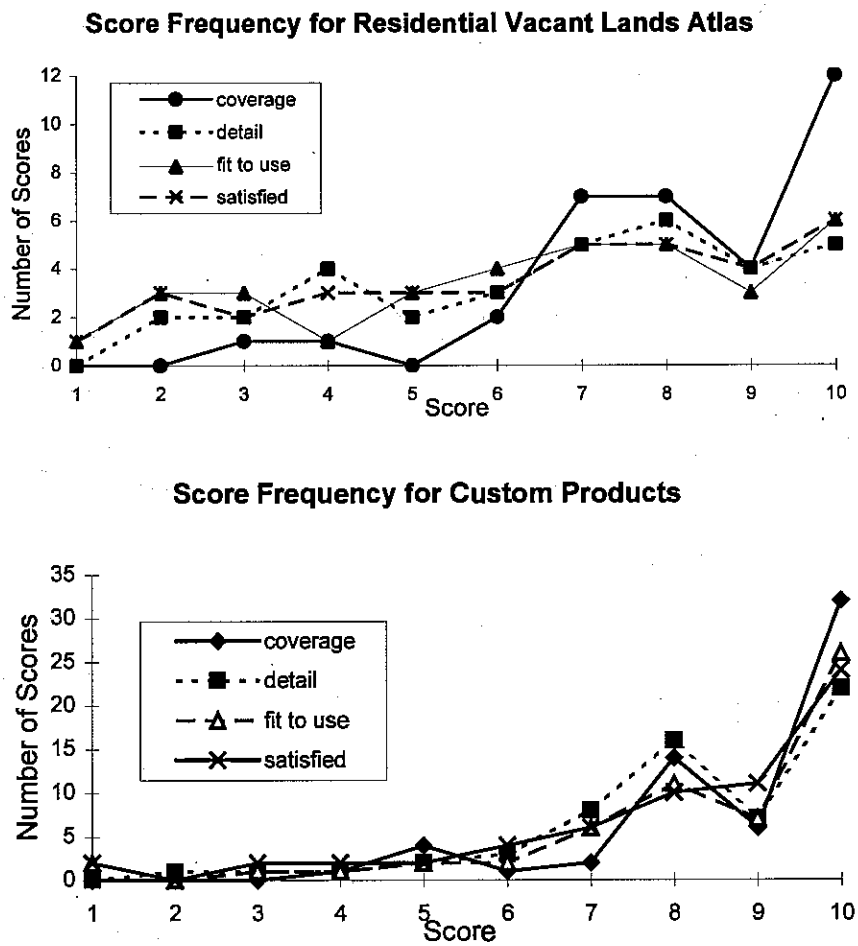

Figure 3-2. Distribution of scores assigned by respondents for the RLIS products that received the highest and lowest overall scores.

Scores of 5 and below were registered both by planners and others who work for Metro's partner governments and by developers, realtors, and others who purchased products through the Storefront Program. We wanted to know why these users assigned such low scores to the products they received. To see what lessons might be learned for future marketing of RLIS products, we conducted follow-up interviews with many of those respondents who gave such low scores. The next chapter discusses what they told us.

Chapter 4. Examples of Problems Customers Encountered in Certain RLIS Products

In this chapter, we present several more detailed descriptions of problems that external customers encountered with products they received through the Subscription Program or the Storefront Program. These summaries are drawn from follow-up interviews conducted with survey respondents. For the most part, the customers whose stories are summarized below gave scores of 5 or lower to one or more of the products they purchased. *Because these examples focus on users who had problems with the information, they are not necessarily representative of Metro's external customers as a whole. Their stories are presented here because they provide an illustrative sample of the types of problems that some customers encountered.*

Concerns raised by these customers and others who had difficulty with RLIS products centered mainly on three characteristics: (1) the level of detail provided, (2) the fitness of the information for the desired use, and (3) lack of awareness of the limitations of the data for the intended use. Many of these users commented that the information they received either was not in sufficient detail to meet their needs or was incomplete or inaccurate and therefore not suitable for the intended application.

Problems With Taxlot /Assessor Data and Other Information

Planners and information specialists in one municipality said that RLIS information contained in the Taxlot Lines/Assessor Data digital product is often incomplete and/or inaccurate. They said they do not consider the taxlot lines to be accurate and they do not match information in the county files. DRC's updates, they said, are too late to be useful. One planner said that cities also need very detailed information on demographic and employment data for their planning purposes, and the data from Metro are too old and not in a convenient form. He said it was more cost effective to contract with a private firm for this information than to get it from Metro.

Two of the RLIS users in this city also mentioned that for the digital product called "Single Line Street Base with Addresses," the street centerline data are inaccurate. They said the data are not consistent with the city's base maps and the RLIS street centerlines clearly dissect parcels of land. Some also said that several subdivisions in their city are still not in the RLIS database even though the plats were recorded from 6 months to over 2 years ago. These customers said they think more people will want to use the RLIS data in the future, but these additional users will also want the data to be accurate. They said they would like to see Metro meet this need, but they do not feel they can rely on the information in its current form.

Problems With Demographic Data

An official of a local service district stated that demographic data he received from the DRC were incomplete. The information included the number of single-family and multi-family dwelling units and population estimates by jurisdiction for areas inside the district's boundary for 1990, 1992, and 1994. The customer noticed that the population estimates for several cities within the district appeared to be incorrect. He called the DRC about this problem and the DRC sent him revised data that changed the population figures for 7 of the district's 9 municipal areas.

The customer also found that the information on multi-family dwelling units was not accurate. DRC had, for the years in question, updated the total of multifamily dwelling units by adding the number of multi-family building *permits* to the number of dwelling *units* in the previous year. As the customer pointed out, this procedure will work for single-family dwelling units for which it can be assumed that one building permit equals one dwelling, but it does not work for multi-family housing because each building permit for multi-family equals many housing units. The customer said he had informed the DRC staff about this problem and they told him that they would not have actual multi-family dwelling unit information until the year 2000 census data were available. He said that the multi-family data he bought from the DRC were useless for his study and that if the DRC had informed him about what was available he would not have ordered it. The customer said he also

regarded the data's price of $1,545 as somewhat unreasonable. He said the information was on three pages.

Problems With Use of Vacant Lands and Other Data

A GIS coordinator at a city government said that RLIS products were good starting points for the city's use but simply are not detailed and accurate enough to be used for city planning purposes without being redone and corrected. He gave several types of examples. One example involved the Vacant Lands Atlases. He said the city staff had found a number of parcels that the atlases had identified as vacant, but which actually were being used. Examples included a church parking lot, a landscaped traffic circle, and 6 parcels that already have residences on them. He said he thought it was unlikely that any of these parcels would be developed further.

The coordinator also identified problems with the zoning information provided under RLIS. Examples of incorrect information supplied on an RLIS map included zoning the Willamette River, which should not have been zoned at all, and assigning one area a zoning code that the city does not use. He said the city corrected the zoning on the map and shared the information with the DRC, but it took a lot of time for the city to correct the erroneous data it received.

Finally, while this customer gave high ratings (between 8 and 10) to the taxlot information and said he thought the DRC had probably done as well as it could with it, the information was not accurate enough for the city's planning purposes, and so the city was redoing it. He said taxlot numbers and ownership information were good, but the placement of lot lines was not. For example, he said a line may appear to be 100 feet long on an RLIS map, but is only 80 feet long on the ground. Also, he said the RLIS information may show the zoning going out to the street centerline, but on the ground it stops at the property line.

Problems With Incorrect Zoning Data

A planner with a local county cited several problems that made a December 1995 RLIS map set unusable. One problem was that the maps had several zoning designations that were incorrect. For example, one map showed an exclusive farm use code that the county had

not used since 1993. A second problem was that old county zoning codes were shown for an area that had been incorporated into the city. The planner said the county had sent corrections to Metro but the incorrect zoning was still shown on the RLIS maps after three tries at getting it corrected. The planner also cited examples in which the RLIS products contained information that was not consistent with county information with regard to lot lines, acreages, and slope hazards.

Problems With Prices and Accessibility of Data

An executive in a real estate consulting firm said that he has been unable to obtain the map information he needs for his business from the RLIS database. He said the database has the necessary information, but his cost in terms of software, training, and equipment needed to access the information is too high. RLIS could be used to create a fantastic mapping tool, he said, if user friendly software were available to make it accessible to the personal computer users such as himself. The executive said he thought a large market exists among appraisal and real estate firms, engineering firms, and consultants, if Metro were offering the right products at affordable prices.

Problems With Overall Accuracy of Data

Another real estate executive responding to our survey discussed two problems she had with RLIS products. The first involved a custom map that she purchased from Metro. She said the map contained too many errors to be of much use. She pointed out some areas on the map that she had corrected, including several areas that were shown as, "No data available," even though the land uses on those areas had been in place for a long time, and included a park and ride lot, a school, and some commercial property. She also pointed out some areas shown on the map as "Agriculture," that were actually developed as single-family, multi-family, or commercial sites. She felt that Metro needs to do a better job of keeping land uses accurate and current on their maps and accurately showing conditional uses, such as parking lots.

The second problem she noted was that some vacant land parcels were counted twice in the Vacant Lands Atlas for residential lands that she had purchased. She said the parcel is actually 9.9 acres, but is shown as 5.44 acres on one page of the atlas, and at 14.18 acres on

another page for a total of 19.62 acres. She called the DRC about this and received an errata sheet explaining that, "For taxlots shown on two pages (split by section lines) the acreage listed may be doubled. This error does not occur consistently. Please confirm these acreages with other sources." She wondered how such errors might affect the total land that Metro thinks is available for development. She expressed the opinion that if the DRC cannot improve the quality of the data it sells, it should not be selling it.

Chapter 5. Conclusions and Recommendations

Conclusion

DRC has been successful in generating revenue from the sale of RLIS products and services. According to the DRC, revenues from the subscriptions and the Storefront Programs exceeded $1.3 million over five years, with costs of about $1.2 million.

The buyers of RLIS products that responded to our user survey had widely divergent views as to how satisfied they were with the Metro data. Although the average user satisfaction ratings for products were generally positive, ranging from 6.54 for the residential Vacant Lands Atlas to 7.98 for Custom Products on a 1-10 scale, some users gave much lower ratings. A number of users stated that the RLIS information was either not sufficiently detailed for their use or was out of date, incomplete, or inaccurate. Many of them still regarded the data as a good starting point, but some expressed overall disappointment with products the DRC sold to them.

The customers' ratings, even in the 6 to 9 range, along with their critical comments indicate a potential problem for future sales of RLIS products. Several customers who gave relatively high ratings for some products indicated that any problems at all in a product they need to rely on are unacceptable. Purchasers perceive Metro as being the creator of the data, rather than as an integrator of data received from local jurisdictions. The purchasers therefore hold Metro responsible for any inaccuracies found in the data.

In some cases, customers' expectations are probably too high and fail to take into account Metro's warnings about the age, source, and level of detail or accuracy of the data. These cautions can be found both in Metro's purchase agreement with its data customers and the product descriptions in the DRC catalog. In addition, there are probably limitations in how far Metro can go in satisfying some customers' needs for accuracy, timeliness, and specialized data and services. Despite the

printed warnings, however, customers continue to purchase RLIS products that do not meet their expectations or fulfill their data needs. This has caused some of these customers to question the ability of the DRC to provide them with accurate, useful data. We believe the DRC staff needs to redouble its efforts to explain the limitations of the RLIS products to potential customers. Doing so may help Metro avoid part of the customer dissatisfaction that we noted.

For the most part, the survey respondents felt DRC personnel were easy to work with. However, some customers did believe they had problems with the DRC in ordering and obtaining products they wanted. Some suggestions made by customers to improve customer relations, and which we believe are worthy of Metro's consideration, include the following:

- Issuing a newsletter to subscribers to explain things like when they can expect updated data to appear in the RLIS database, and to provide more detailed explanations of RLIS products than appear in the Data Dictionary.
- Developing a formal way to record problems that customers are having with DRC products. This could be done by using a form or a log so that problems brought to DRC's attention can be tracked until they are corrected.
- Ensuring that customers have a clear explanation of what is included in their bills.
- Holding meetings with members of the business community who are current or potential DRC customers and Metro managers and knowledgeable DRC staff to discuss the private sector's needs for RLIS data at a reasonable cost, and how it might be done.

Some of the cases cited by the RLIS users who responded to our survey indicate areas in which the RLIS products need to be improved to increase their accuracy, level of detail, and timeliness to make them more useful to Metro's local government partners, and private sector users. In addition, improvements in the data should help ensure greater satisfaction among Metro's external customers and expand the sale of RLIS products. If these

improvements cannot be done internally, either because they are too expensive or time-consuming or because they detract too much from DRC's primary role of providing information for Metro's planning purposes, a private-sector value-added reseller may have the resources and flexibility to better meet customers' needs. Metro should continue to explore the use of value-added resellers (VAR's) to better meet the needs of their customers for specialized products and services, while allowing the DRC to concentrate on their central mission of serving Metro's planners.

The RLIS data are an essential part of Metro's regional planning activities. Metro management believes the data meet the accuracy requirements of a broad-scale land information system. However, when the local government subscribers and the Storefront customers for the RLIS products and services find the kind of errors, omissions, and out-of-date information they reported in our user satisfaction survey it causes them to question the soundness of the data Metro uses in its large-scale planning activities. Metro needs to consider if the DRC's aggressive pursuit of revenue generation has resulted in "overselling" the RLIS products and services to outside users who have high expectations about the timeliness and accuracy of the databases, and created the unexpected result of causing them to question all Metro programs that rely on RLIS data.

Recommendations

The Office of the Auditor believes that Metro should take several steps to improve the satisfaction of the local government subscribers and Storefront customers with the RLIS data and services:

1. DRC should develop a plan for improving the accuracy, level of detail, and timeliness of RLIS data to make it more useful to Metro's local government partners and private sector users. The plan should include a determination by DRC of what they can do to improve the data, and what changes in operations or additional resources might be needed to achieve the improvements. DRC also needs to determine what it cannot do to improve the data and identify the reasons such improvements cannot be made. The DRC should

then present its plan to the Executive Officer for his consideration.

2. DRC can take some immediate steps that should help to increase the level of customer satisfaction with the RLIS data and services:

- DRC staff should redouble its efforts to explain the limitations of the RLIS products to potential customers as a way of assuring before purchase that the product will meet the customer's needs. DRC should also formalize this effort by developing a user's guide to explain the appropriate use of the data and its limitations for certain uses.

- In the event customers have problems with an RLIS product they have purchased, DRC should be sure the customer knows whom to contact to resolve the problem, and should develop a formal system to track the problems until they are corrected.

- DRC should ensure that customers are given a clear, detailed explanation of the items included in their bills.

- DRC should consider ways to bring together members of the business community who are current or potential DRC customers with Metro management and DRC staff to discuss the private sector's needs for RLIS data at a reasonable cost, and how these needs might be met. The public often sees the price structure developed for data sales as excessive because it exceeds their expectations of what "public data" should cost.

- DRC should consider developing and issuing a newsletter to subscribers to (1) explain such things as when customers can expect updated data to appear in the RLIS database, and (2) provide more detailed explanations of RLIS products than appear in the Data Dictionary.

3. DRC should continue to explore the use of value-added resellers to better meet the needs of their customers for specialized products and services. A private-sector value-added reseller may have the resources and flexibility to better meet the customers' needs for specialized services, while allowing DRC to concentrate on their central mission of serving Metro's planners.

Other Issues

As we noted in the report, Metro's role as developer and provider of the land information system for the region is evolving. Local governments are now creating much of the data that Metro uses and are developing and maintaining their own GIS systems. The DRC's role as integrator of the data is essential for Metro's regional planning and modeling. This role requires that the DRC maintain strong partnerships with these local governments to assure their continued cooperation in sharing their data with Metro. It may be time for Metro to consider improving the data-sharing environment by developing new strategic relationships with their local government partners that provide for sharing revenues from sales of RLIS data with them.

In addition, in discussions with GIS users during this review, they raised the possibility that by making use of new technologies, high speed connections could be established between the DRC and the jurisdictions that are creating and maintaining the data. They said that this could possibly increase the accuracy and timeliness of the updates to the RLIS database.

Response to the Report

M E M O R A N D U M

METRO

September 5, 1997

To: Alexis Dow CPA, Metro Auditor

From: Mike Burton, Metro Executive Officer

RE: Audit of Data Resource Center Storefront Services

I have received the audit report on the Data Resource Center's Storefront services dated August 21, 1997. Thank you for the opportunity to review and respond to this report. The following constitutes the response of the Executive Officer and staff to the report.

1. **Recommendation: DRC should develop a plan for improving the accuracy, level of detail, and timeliness of RLIS data to make it more useful to Metro's local government partners and private sector users. The plan should include a determination by DRC of what they can do to improve the data, and what changes in operations or additional resources might be needed to achieve the improvements. DRC also needs to determine what it cannot do to improve the data and identify the reasons such improvements cannot be made. The DRC should then present its plan to the Executive Officer for his consideration.**

   - A plan will be developed in cooperation with jurisdictions providing Metro with data for integration into RLIS. They are now the generators of much of the RLIS data and must be committed to efforts for improving its quality. The planning process will include an assessment of what can be done to improve the data and how the improvements can best be achieved. There will also be a determination of what cannot or will not be done and how these limitations will affect customer service. This plan will also articulate policies on data distribution to outside users to assure proper data usage and provide for an effective method to communicate to customers each data item's accuracy, currency and reliability. A recommended plan will be submitted to the executive officer in six months.

2. **Recommendation: DRC can take some immediate steps that should help to increase the level of customer satisfaction with the RLIS data and services.**

   - Increase efforts to explain limitations of RLIS products to potential customers. This can be accomplished by developing a RLIS Users Guide The RLIS data dictionary will be rewritten for non-technical users to be more user friendly. This will be ready for distribution with the RLIS CD ROM to be distributed in the third quarter of this fiscal year.

   - DRC should be sure the customer knows whom to contact to resolve problems and should develop a formal system to track problems until they are corrected.
     We have a database of all purchasers and will expand it to include a problem-tracking field for each account. Each sale will include information as to who to contact with problems. This will be operational in three months.

   - DRC should insure that customers are given a clear, detailed explanation of the items included in their bills.
     These procedures are being put into place and will be into full operation by October 1.

   - DRC should consider ways to bring together members of the business community who are DRC customers to discuss the private sector's needs for RLIS data at a reasonable cost.....
     The the audit survey mailing list is a good starting point for beginning such a dialogue with private sector clients. This can be augmented with potential customers taken from the Inside Contacts business list on the DRC computer. It is therefore requested that the Office of the Auditor provide DRC staff with their mailing list to initiate this project.

- DRC should consider developing and issuing a newsletter to subscribers.....
  Work is in progress to develop an electronic RLIS Storefront and is included in this fiscal year's budget. This Web site will enable RLIS customers to download the latest version of products, make queries of the database, download mapped results, and receive the latest news about DRC products and services. We are including customer's E-mail address in our customer database and will be capable of "pushing" news to them. Service and data charges will be made on a subscription basis.

3. **Recommendation: DRC should continue to explore the use of value added resellers to better meet the needs of their customers for specialized products and services**.....(*continues*)

- Efforts will continue to enlist additional value added resellers.

Other Issues: It may be time for Metro to consider improving the data-sharing environment by developing new strategic relationships with their local government partners that provide for sharing revenues from sales of RLIS data with them....In addition, high speed connections could be established between the DRC and the jurisdictions that are creating and maintaining the data. (*continues*)

- The development of new strategic relationships has been occurring for the past year. For example, an IGA has been signed with Multnomah County that returns a portion of revenues from DRC sale of their data in exchange for receiving regular updates of their tax maps and assessor data. Similar negotiations are underway with Washington and Clackamas counties.

- High-speed connections are being negotiated with local governments. For example, Metro is paying for disk space on Washington County's newly installed Web server where they will store the most current versions of the GIS databases for downloading to Metro. This is intended to serve as a demonstration project to be replicated with other jurisdictions. We will continue to identify and pursue opportunities for improving the data sharing environment and working with our local government partners.

RLIS REGIONAL LAND INFORMATION SYSTEM

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Portland, OR 97232

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fax: (503) 797-1909
e-mail: drc@metro.dst.or.us
Hours: Monday - Friday 8:00 a.m. - 5:00 p.m.

PRE-PRINTED MAPS

BIKE MAPS

Bike There (Bicycle Suitability Map). $3.95

BOUNDARY MAPS

Urban Growth Boundary
8.5"x11" Metro region. . . . . .no charge
18"x24" 4-county region. $2.00
34"x44" Metro Region . . . . . $5.00 (b/w)
. . . . . $30.00 (color)
34"x44" per county . . . . . $5.00 (b/w)
. . . . . $30.00 (color)
Legal description plat maps $2.00

Metro Boundary
8.5"x11" Metro region. . . . . .no charge
18"x24" 4-county region. $2.00
34"x44" Metro Region . . . . . $5.00 (b/w)
. . . . . $30.00 (color)
34"x44" per county . . . . . $5.00 (b/w)
. . . . . $30.00 (color)

Metro Council District Boundaries
8.5"x11" Metro region. . . . . .no charge
18"x24" 4-county region. $2.00
18"x24" Council District $2.00
34"x44" Metro Region . . . . . $5.00 (b/w)
. . . . . $30.00 (color)

City/County Boundaries
11"x17" $3.00
34"x44" $30.00

Zip Code Boundaries
18"x24" $3.00

Garbage Hauler Franchise Areas
34"x44" Metro Region. $25.00
34"x44" per county $25.00

ENVIRONMENTAL MAPS

100-year Flood Plain
34"x44" Metro Region. $30.00
34"x44" per county $30.00

LAND INFORMATION MAPS

Assessor's Land Use
34"x44" per county $30.00

Zoning
34"x44" Metro Region. $30.00
34"x44" per county $30.00

Land Use Plans
34"x44" Metro Region. $30.00
34"x44" per county $30.00

Undeveloped Land
34"x44" Metro Region. $30.00
34"x44" per county $30.00

STREET MAPS

Major Highway Corridors
8.5"x11" Metro region. . . . . .no charge
18"x24" Metro region. $2.00

Major Arterial Streets
8.5"x11" Metro region. . . . . .no charge
18"x24" 4-county region. $2.00

All Arterial Streets
18"x24" 4-county region. $3.00

All Streets
34"x44" per county . . . . . $5.00 (b/w)
. . . . . $30.00 (color)

ODOT Street Maps (1988) — 1000 scale
Per Sheet. $5.00
Complete Series. $50.00

ODOT Street Maps (1988) — 2000 scale
Per Sheet. $5.00
Complete Series. $25.00

TAX LOT BASE MAPS

Tax Lot Base
34"x44" Metro Region. $5.00
34"x44" per county $5.00

AERIAL PHOTOGRAPHS

**Please allow 1 - 2 days for processing.

Index map. . . . . no charge
Blackline copy. $12.00
2 - 10 copies. . . . . $10.00/ea.
11-25 copies. . . . . $ 8.00/ea.
26-50 copies. . . . . $ 7.00/ea.
More than 50 copies. . . . . $ 6.00/ea.
Complete Series (247 photos). $1,000

DEMOGRAPHIC AND EMPLOYMENT PUBLICATIONS AND MAPS

1990 Census Tract map
18"x24" $3.00

Publications

2015 Regional Forecast and Urban Development Trends. $20.00

Profiles of the Portland-Vancouver Economy $10.00

Aggregate Housing Demand. $10.00

Metro Measured. $10.00

Commuting Patterns. $15.00

1994 Employment (Census Tract Estimates) $5.00

1995 Populatian , Households, Housing Units by Census Tract $10.00
with 1990 Census Tract Map $12.00
(estimates based on building permits not actual head count)

Market Profile Service

Based on a radius or defined geographic area or travel time $65.00

REGIONAL NATURAL HAZARD MITIGATION PROGRAM PUBLICATIONS AND MAPS

Publications

The Earthquake Scenario Pilot Project: Assessment of Damage and Losses, Metro and Oregon Department of Geology and Mineral Industries, January, 1993 . . . . . $15.00

Pilot Relative Earthquake Hazard Map of the Portland Quadrangle, Oregon Department of Geology and Mineral Industries, 1993 . . . . . free

Earthquake Workshop Proceedings, Metro, January, 1993 . . . . . $2.00

Using Earthquake Hazard Maps for Land Use Planning and Building Code Administration: Portland Metropolitan Area, Report of the Metro Advisory Committee for Mitigating Earthquake Damage, May, 1996 . . . . . $7.00

DIGITAL DATA

Metro's Data Resource Center has two new CD-ROM products to help you quickly produce custom tailored maps using the RLIS database: RLIS Lite and Pro Extension. These CD's are available in either ArcView Shapefile or MapInfo MIF format.

The RLIS Lite CD includes these data layers:

- Taxlot line and related assessor records (e.g., value, size, owner and sales value)
- Streets
- Zoning
- Comprehensive Plan
- City and County Boundaries
- Rivers
- Watersheds
- National Wetlands Inventory
- Urban growth boundary
- ZIP Codes
- Neighborhood associations
- Census tracts
- Topography (100-foot contours)
- Soils
- Parks
- Building permits
- Schools
- 100-year flood plain

The Pro Extension CD includes these additional data layers:

- Address-matachable street data
- Vacant lands inventory
- Detailed topography (10-foot contours)

PRICING:

RLIS LiteCD ..... $895.00 **Pro Extension.....$595.00**

A 50 percent price reduction is available to not-for-profit users upon presentation of intent to the Data Resource Center.

Network licenses for RLIS Lite products are also available.

The data layers are also available individually and/or at smaller geographies. They can be provided on a variety of media, including CD-ROM, ftp (Internet file transfer), DAT cartridge or 3.5" floppy disk. Individual data layers are delivered as Arc/Info export files, ArcView Shapefiles or as DXF files. Conversion to MapInfo file formats is available for an additional fee.

The RLIS databases are copyrighted and disseminated via purchase agreement that restricts resale or distribution outside the purchasing organization. Copyrighting of these databases is pursuant to ORS 268.

ALL OF RLIS DATABASE

Per section:

1 - 50 sections	$54.00
51 - 150 sections	$44.00
More than 150 sections	$28.00
Regional coverage	$15,000.00

TAX LOT BASE

Per section:

1 - 50 sections	$44.00
51 - 150 sections	$34.00
More than 150 sections	$22.00
Regional coverage	$12,000.00

UNDEVELOPED LAND

Per section:

1 - 50 sections	$12.00
51 - 150 sections	$10.00
More than 150 sections	$6.00
Regional coverage	$3,000.00

ZONING/LAND USE PLANS

Per section:

1 - 50 sections	$12.00
51 - 150 sections	$10.00
More than 150 sections	$6.00
Regional coverage	$3,000.00

100-YEAR FLOOD PLAIN
TOPOGRAPHY
HYDROGRAPHY
SOILS
NATIONAL WETLANDS INVENTORY

Set-up Fee	$90.00
Per USGS 7.5 Minute Quadrangle	$6.00

METRO -- OFFICE OF THE AUDITOR

Regional Land Information System (RLIS) User Survey

Q1. What would you say are the main reasons/applications for your use of RLIS products? Please prioritize your top five uses: 1= most frequent application, 2= next most frequent, etc. (Example: Municipal/Urban Planning 2 Environmental Planning 1 Right-of-way Planning 3).5.14 __

Municipal/Urban Planning	____01	Right-of-way Planning	____06
Real Estate Development/Construction	____02	Retail Matters	____07
Value Added Resale	____03	Engineering	____08
Transportation Planning	____04	Education	____09
Environmental Planning	____05	Public Services/Utilities	____10
		Other (please specify)	____99

Q2. A. Please make a check mark (√) in the box at left to indicate the types of RLIS products you use (check as many as appropriate). B. Indicate your view as to the importance of each (whether you use it or not). C. Indicate the relative percent of use for each product group. (Example: Hard Copy = 75% Digital Data = 25% Total = 100%).

A.Use √		B. Importance of Product: Very Important	Somewhat Important	Not Important	C. Proportion of Use
	Hard Copy Items				____%
❑	Pre-Printed Maps/Reports (Boundaries, Zones, Roads)16	3	2	1	
❑	Vacant Lands Atlas/Residential17	3	2	1	
❑	Vacant Lands Atlas/Commercial-Industrial18	3	2	1	
❑	Demographic Data (2015 Forecasts, Population Estimates, Census Data)19	3	2	1	
❑	Economic & Employment Data (Housing, Development Trends, Commuting Patterns)20	3	2	1	
❑	Environmental Information (Flood Plains)21	3	2	1	
❑	Custom Products (please specify, e.g. reports, maps):22	3	2	1	
	Digital Data				____%
❑	RLIS Lite / CD ROM23	3	2	1	
❑	Pro Extension / CD ROM24	3	2	1	
❑	MAGIC 5-disk set25	3	2	1	
❑	Taxlot Base (All or Partial)26	3	2	1	
❑	Single Line Streets & Addresses27	3	2	1	
❑	Demographic Data28	3	2	1	
❑	Employment Data29	3	2	1	
❑	Environmental Data30	3	2	1	
❑	Undeveloped Land Data (Sections or region-wide)31	3	2	1	
❑	Zoning and Land Use Plans (Sections or region-wide)32	3	2	1	
❑	Other (Please specify):33	3	2	1	
				Total	100%

Comments (attach additional pages if needed):

Version: 2/19/97

Product Satisfaction

Q3. Please rate each of the following, first for Hard Copy items and then for Digital Data. Use a scale of 1 - 10, where 10 means very good/satisfied, and 1 means very poor/not at all satisfied. If not applicable, please check "N/A".

HARD COPY PRODUCTS: (Rate 1-10)	Coverage/ Map Area	Level of Detail	Fitness for Use	General Satisfaction	N/A
Pre-printed Maps / Reports$_{46.56}$	____	____	____	____	❑$_{99}$
Vacant Lands Atlas (Residential)$_{58.68}$	____	____	____	____	❑$_{99}$
Vacant Lands Atlas (Commercial/Industrial)$_{70.80}$	____	____	____	____	❑$_{99}$
Demographic Data$_{82.92}$	____	____	____	____	❑$_{99}$
Economic & Employment Data$_{94.104}$	____	____	____	____	❑$_{99}$
Environmental Information$_{106.116}$	____	____	____	____	❑$_{99}$
Custom Products (Please specify):$_{118.128}$	____	____	____	____	❑$_{99}$

DIGITAL DATA PRODUCTS: (Rate 1-10)	Coverage/ Map Area	Level of Detail	Fitness for Use	General Satisfaction	N/A
Taxlot Lines / Assessor Data$_{130.140}$	____	____	____	____	❑$_{99}$
Single Line Street Base with Addresses$_{142.152}$	____	____	____	____	❑$_{99}$
Demographic Data$_{154.164}$	____	____	____	____	❑$_{99}$
Employment Data$_{166.176}$	____	____	____	____	❑$_{99}$
Environmental Data$_{178.188}$	____	____	____	____	❑$_{99}$
Undeveloped Land$_{190.200}$	____	____	____	____	❑$_{99}$
Zoning or Use Permits$_{202.212}$	____	____	____	____	❑$_{99}$
Other (Please specify)$_{214.224}$	____	____	____	____	❑$_{99}$

Q4. (Digital Data Users Only) Which data format (s) do you use?$_{229.233}$

RLIS Lite (MapInfo TAB) ❑$_1$ DXF(AutoCAD) ❑$_2$ ARC/Info coverage ❑$_3$

RLIS Lite (ArcView Shapefiles) ❑$_4$ Other (Specify):$_9$

Q5. For items you rated a "5" or lower, please explain and indicate whether your comments are about Hard Copy or Digital Data and the product to which your comments refer. (If you attach an additional page, please indicate "Q5").$_{235.239}$

Customer Service Issues

Metro's Data Resource Center has asked us to include the following questions so they can better serve you.

Q6. If you have questions concerning RLIS data, how easy is it to contact a Metro representative to get answers?$_{244}$
Very easy ❑$_4$ Somewhat easy ❑$_3$ Somewhat difficult ❑$_2$ Very difficult ❑$_1$

Q7. How familiar are you with Metro's sources of data?$_{246}$
Very familiar ❑$_4$ Somewhat familiar ❑$_3$ Somewhat unfamiliar ❑$_2$ Completely unfamiliar ❑$_1$

Q8. To what extent do you consider Metro responsible for the accuracy of the data they provide?$_{248}$
Very responsible ❑$_4$ Somewhat responsible ❑$_3$ Not necessarily responsible ❑$_2$ Not responsible ❑$_1$

Q9. How aware are you of the availability of the following information on CD ROM?

	Very much	Somewhat	Not at all
Taxlot lines/Assessor data$_{250}$	❑$_3$	❑$_2$	❑$_1$
Zoning$_{251}$	❑$_3$	❑$_2$	❑$_1$
Environmental constraints$_{252}$	❑$_3$	❑$_2$	❑$_1$
Street maps with addresses$_{253}$	❑$_3$	❑$_2$	❑$_1$
Vacant lands$_{254}$	❑$_3$	❑$_2$	❑$_1$

Q10a. Do you currently have Mapping/Geographic Information System (GIS) software, or plan to purchase some within the next year?$_{256}$ Yes ❑$_1$ No ❑$_2$

Q10b. (If yes) Which brand(s)?$_{257..262}$ Atlas ❑$_1$ Arc/Info ❑$_2$ ArcView ❑$_3$ AutoCAD ❑$_4$ Map Info ❑$_5$ Micro Station ❑$_6$

Q11. For your purposes, how timely/current must Metro's GIS information be?$_{264.267}$

Q12a. How reasonable is the cost of Metro's RLIS products?$_{269}$
Very reasonable ❑$_4$ Somewhat reasonable ❑$_3$ Somewhat unreasonable ❑$_2$ Very unreasonable ❑$_1$

Q12b. (If unreasonable) Please explain:$_{271.275}$

Q13. For a "typical" custom products request, about how much do you expect to pay? $_{277.282}$
<$75 ❑$_1$ $75-150 ❑$_2$ $150-500 ❑$_3$ $500-1000 ❑$_4$ $1000+ ❑$_5$ Not Applicable ❑$_9$

Q14. With regard to your primary application/use (Q1), what land-related or demographic information (if any) is your organization having difficulty obtaining? Please indicate whether your comments are about Hard Copy or Digital Data. (If you attach a page, please indicate "Q14").$_{284.288}$

Q15a. Metro may soon expand its Internet web site and establish a subscription service so that subscribers can get RLIS and related customized products on-line. Do you currently have access to the Internet?$_{290}$ Yes ❑$_1$ No ❑$_2$

Q15b. (If yes) How often do you transfer data via the Internet?$_{291}$

Daily ❑$_1$ Weekly ❑$_2$ Several times a month ❑$_3$ Less often ❑$_4$

Q15c. (If no) How likely are you to get Internet access within the next year?$_{292}$

Very likely ❑$_4$ Somewhat likely ❑$_3$ Somewhat unlikely ❑$_2$ Very unlikely ❑$_1$

Q16a. Does (Do) your database (s) include spatial data (such as addresses or tax lot numbers) that enables you to include maps for reporting and/or analytical purposes?$_{294}$ Yes ❑$_1$ No ❑$_2$

Q16b. (If yes) How interested are you in uploading Metro data to enhance your database?$_{295}$

Very interested ❑$_3$ Somewhat interested ❑$_2$ Not interested ❑$_1$

Q17. Which of the following <u>best</u> describes your organization? (Please check <u>one</u> response)$_{297}$

Private Party/Individual	❑$_{01}$	Other Advocacy (explain)	❑$_{09}$	Public Utility	❑$_{16}$
Real Estate Sales	❑$_{02}$	Property Insurance	❑$_{10}$	Special Service District	❑$_{17}$
Real Estate Development	❑$_{03}$	Academia/Education	❑$_{11}$	Local Government	❑$_{18}$
Engineering/Architecture	❑$_{04}$	Law	❑$_{12}$	County Government	❑$_{19}$
Title Insurance	❑$_{05}$	Manufacturing	❑$_{13}$	State Government	❑$_{20}$
Neighborhood Association	❑$_{06}$	Retail/Wholesale	❑$_{14}$	Federal Government	❑$_{21}$
Consulting	❑$_{07}$	Value Added Resale	❑$_{15}$	Other (Please specify)	❑$_{99}$
Environmental Advocacy	❑$_{08}$				

Q18. Please indicate if you would be available for follow-up discussion on these issues:$_{299}$ Yes ❑$_1$ No ❑$_2$

Q19. Would you like to receive a copy of the Auditor's report on this matter?$_{301}$ Yes ❑$_1$ No ❑$_2$

Please update or complete the following information as necessary:

Name
Organization

Job Title
Address
City/State/Zip
Phone Number
Internet Email: _____
HTTP Address: _____

Thank you for participating.
Please use the accompanying prepaid envelope or fax the questionnaire to:

Riley Research Associates, 620 SW Fifth Avenue, Ste 404, Portland, OR 97204
Phone: 503-222-4179 Fax: 503-222-4313
E-mail: RileyAssoc@AOL.COM

Please mail back this questionnaire within 10 days

Appendix C. Job titles and organizations of those responding to RLIS satisfaction survey.

	Job Title										
Organization	Info. Sys. and GIS	Planning	Sales & marketing	Senior Management	Engineering	Consulting and Legal	Property Managment	Property Development	Misc. or other	None or blank	Grand Total
Government	14	20	3	8	7	2	1	5	13	21	94
Real estate	5	4	0	0	2	1	0	1	3	6	22
Consulting	4	6	2	4	3	2	3	0	2	5	31
Engineering or architect.	0	3	1	1	0	0	0	1	0	4	10
Academia/education	1	0	0	4	0	0	0	0	1	2	8
Public utility	1	0	1	0	0	0	0	1	2	3	8
Law	0	0	0	1	1	0	0	0	1	0	3
Neighborhood assn.	0	0	0	1	0	0	0	0	0	1	2
Other advocacy	0	0	0	0	1	1	0	0	0	0	2
Retail or wholesale	1	0	0	0	1	0	0	0	0	0	2
Value added resale	0	2	0	0	0	0	0	0	0	0	2
Individual	0	0	1	0	0	0	0	0	0	0	1
Other or blank	2	2	0	1	0	1	0	0	2	3	11
	28	37	8	20	15	7	4	8	24	45	196

Appendix D. Detail of responses to survey of satisfaction with RLIS products sold by Metro.

	High Score	Low Score	Average	Score frequency 1	2	3	4	5	6	7	8	9	10	Total Responses	Non-Responses	Number Surveyed	Comments
Hard copy products																	
Pre-printed maps																	
Coverage	10	1	8.46	1	0	0	0	6	2	8	29	14	33	93	103	196	
Level of detail	10	2	7.76	0	2	0	2	7	8	17	23	16	18	93	103	196	
Fitness for use	10	1	7.39	1	2	1	3	9	11	13	24	9	17	90	106	196	
Satisfaction	10	1	7.71	1	1	1	1	9	5	19	24	15	18	94	102	196	
Vacant Lands Atlas (residential)																	
Coverage	10	3	8.24	0	0	1	1	0	2	7	7	4	12	34	162	196	
Level of detail	10	2	6.76	0	2	2	4	2	3	5	6	4	5	33	163	196	
Fitness for use	10	1	6.50	1	3	3	1	3	4	5	5	3	6	34	162	196	
Satisfaction	10	1	6.54	1	3	2	3	3	3	5	5	4	6	35	161	196	
Vacant Lands Atlas (Commercial)																	
Coverage	10	5	8.16	0	0	0	0	2	1	5	7	3	7	25	171	196	
Level of detail	10	2	7.21	0	1	0	2	1	3	5	7	1	4	24	172	196	
Fitness for use	10	2	7.20	0	1	1	1	3	3	4	4	2	6	25	171	196	
Satisfaction	10	2	7.24	0	1	2	1	2	2	3	5	4	5	25	171	196	
Demographic data																	
Coverage	10	1	8.05	1	0	0	0	7	4	4	17	9	17	59	137	196	
Level of detail	10	1	7.06	1	4	0	1	7	7	10	18	6	8	62	134	196	
Fitness for use	10	1	7.13	1	5	0	0	6	7	10	16	9	8	62	134	196	
Satisfaction	10	1	7.30	1	4	0	1	6	2	11	20	12	6	63	133	196	
Economic & employment data																	
Coverage	10	1	7.94	1	0	0	0	5	5	5	11	6	14	47	149	196	
Level of detail	10	2	7.38	0	2	0	0	6	5	9	14	5	7	48	148	196	
Fitness for use	10	2	7.28	0	1	1	0	5	8	8	12	5	6	46	150	196	
Satisfaction	10	2	7.45	0	1	0	1	4	6	10	15	7	5	49	147	196	
Environmental data																	
Coverage	10	5	7.95	0	0	0	0	2	3	9	12	3	8	37	159	196	
Level of detail	9	2	6.25	0	2	2	3	2	7	11	8	0	1	36	160	196	
Fitness for use	10	1	6.64	1	0	1	2	5	5	10	8	2	2	36	160	196	
Satisfaction	10	1	6.74	1	0	1	1	4	7	12	10	1	2	39	157	196	
Custom products																	
Coverage	10	4	8.83	0	0	0	1	4	1	2	14	6	32	60	136	196	
Level of detail	10	2	8.26	0	1	1	1	2	3	8	16	7	22	61	135	196	
Fitness for use	10	1	8.34	2	0	1	1	2	2	6	11	7	26	58	138	196	
Satisfaction	10	0	7.98	2	0	2	2	2	4	6	10	11	24	64	132	196*	* one zero

Appendix D (cont.)																		
		High	Low		Score frequency										Total	Non-	Number	
		Score	Score	Average	1	2	3	4	5	6	7	8	9	10	Responses	Responses	Surveyed	Comments
Digital products																		
Taxlot lines and assessor data																		
	Coverage	10	4	8.55	0	0	0	1	4	4	7	21	22	29	88	108	196	
	Level of detail	10	1	7.61	2	0	1	1	7	11	8	34	9	15	88	108	196	
	Fitness for use	10	1	6.88	3	2	4	4	11	10	8	25	11	10	88	108	196	
	Satisfaction	10	1	7.35	1	0	1	3	11	11	12	26	14	11	90	106	196	
Street base with addresses																		
	Coverage	10	6	8.59	0	0	0	0	0	5	9	14	14	19	61	135	196	
	Level of detail	10	1	7.50	1	0	1	0	5	8	9	25	5	8	62	134	196	
	Fitness for use	10	1	6.84	2	2	2	0	9	9	9	16	6	5	60	136	196	
	Satisfaction	10	1	7.16	1	1	1	2	4	11	13	16	6	6	61	135	196	
Demographic data																		
	Coverage	10	3	8.29	0	0	1	0	2	4	3	4	10	11	35	161	196	
	Level of detail	10	2	7.30	0	1	1	1	6	2	5	11	4	6	37	159	196	
	Fitness for use	10	1	7.11	1	1	1	1	6	1	4	13	2	6	36	160	196	
	Satisfaction	10	2	7.41	0	1	1	1	4	3	6	10	5	6	37	159	196	
Employment data																		
	Coverage	10	5	8.12	0	0	0	0	3	4	4	6	7	9	33	163	196	
	Level of detail	10	2	6.74	0	3	0	1	5	6	4	9	2	4	34	162	196	
	Fitness for use	10	1	6.45	1	3	0	1	4	5	6	9	2	2	33	163	196	
	Satisfaction	10	2	6.78	0	1	2	2	5	4	7	8	4	3	36	160	196	
Environmental data																		
	Coverage	10	1	7.85	1	0	0	0	1	8	9	12	4	12	47	149	196	
	Level of detail	10	1	6.33	1	2	2	4	9	5	8	11	2	4	48	148	196	
	Fitness for use	10	1	6.49	3	0	0	6	6	6	7	11	5	3	47	149	196	
	Satisfaction	10	1	6.82	1	1	0	2	7	11	6	13	4	4	49	147	196	
Undeveloped land																		
	Coverage	10	5	8.41	0	0	0	0	1	3	6	9	6	12	37	159	196	
	Level of detail	10	3	7.13	0	0	2	1	7	4	6	11	4	5	40	156	196	
	Fitness for use	10	1	6.69	1	1	0	4	6	5	4	12	2	4	39	157	196	
	Satisfaction	10	0	6.77	0	1	0	4	6	4	5	10	3	5	39	157	196*	* one zero
Zoning or use permits																		
	Coverage	10	3	8.23	0	0	1	1	4	1	12	7	14	17	57	139	196	
	Level of detail	10	1	7.19	1	1	0	1	10	6	13	11	8	8	59	137	196	
	Fitness for use	10	0	6.58	3	0	3	2	10	6	10	11	9	5	60	136	196*	* one zero
	Satisfaction	10	1	6.90	1	2	0	4	9	6	11	11	10	5	59	137	196	

METRO

Metro Auditor
Report Evaluation Form

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Your feedback helps us do a better job. If you would please take a few minutes to fill out the following information for us, it will help us assess and improve our work.

Name of Audit Report: _____

Please rate the following elements of this report by checking the appropriate box.

	Too Little	Just Right	Too Much
Background Information	❑	❑	❑
Details	❑	❑	❑
Length of Report	❑	❑	❑
Clarity of Writing	❑	❑	❑
Potential Impact	❑	❑	❑

Suggestions for our report format:_____
_____
_____

Suggestions for future studies:_____
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Other comments, ideas, thoughts:_____
_____
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Name (optional):_____

Thanks for taking the time to help us.

Fax: 797-1831
Mail: Metro Auditor, 600 NE Grand Avenue, Portland, OR 97232-2736
Call: Alexis Dow, CPA, Metro Auditor, 797-1891
Email: dowa@metro.dst.or.us