



FINAL REPORT

MEASURING PUBLIC VALUE OF GEOSPATIAL COMMONS: A METROGIS CASE STUDY

[WORKING TITLE: METROGIS QUANTIFY PUBLIC VALUE (QPV) STUDY]

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MetroGIS Quantify Public Value Study

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Project Title: Measuring Public Value of Geospatial Commons: A MetroGIS Case Study

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EXECUTIVE SUMMARY

A clear understanding of benefit that can be realized through collaborative actions to address shared geospatial needs is critical to realizing the full vision of spatial data infrastructure (SDI) initiatives, such as [MetroGIS](#). One element of this knowledge is to understand how public value is created when public producers of geospatial data openly share their data. Accordingly, the principal reason our team proposed this “Quantify Public Value (QPV)” study was to prototype a method to quantify public value that can be created when geospatial data are shared. And, to do so in a manner in which local government policy makers can easily compare and contrast the costs of supporting their operations with and without participating in a geospatial commons.¹

Although we were not able to quantify public value created², we were able to demonstrate:

- There is real and substantive potential to create public value when organizations collaborate within and across sectors to address shared interests.
- There is broad support for the effort needed to realize a geospatial commons in which a wide variety of cross sector interests actively participate.
- “Accurate data” and “executive leadership” are the starting points for the chain of capabilities the study participants agreed are needed to accomplish shared interests.
- A variety of stakeholders value or would value access to parcel data produced the seven counties, which comprise the Minneapolis- St. Paul metropolitan area.
- A path forward for continued work toward developing the ability to measure public value creation. The shared values and interests that policy makers identified offer valuable insight and a basis for subsequent research, whether by MetroGIS or others, to develop actual measures to monitor public value creation (whether quantitatively or qualitatively) when organizations actively participate in a geospatial commons.

Of significance beyond the scope of this study is the community’s corroboration that “accurate data” and “executive leadership” are the starting points to collaboratively address shared values. This finding affirms the importance of MetroGIS’s [mission](#) as an organization and adds clarity to its efforts as it continues to pursue sustainable [regional solutions](#) to a host of shared information needs.

HIGHLIGHTS - METROGIS QPV STUDY

A) ORIGINALLY AWARDED QPV STUDY

The goal of MetroGIS's Quantify Public Value (QPV) Study, as originally conceived and approved for a Category 5 NSDI CAP Grant in April 2010, was to develop of a prototype methodology capable of quantitatively measuring public value created when organizations actively participate in a geospatial commons. The territorial focus was Hennepin County, Minnesota; the 32nd largest county in the United States by population, and the local government jurisdictions within it. The objective, simply stated, involved documenting whether placing geo-referenced parcel data into the public domain creates more public value (from the taxpayer's perspective) than the practice of cost recovery. The scope of this prototyping effort was limited to parcel data (spatial and tabular), in particular, parcel data that adheres to interoperability standards defined by the MetroGIS community. The study proposed interviewing representatives of all forms of government, non-profit, utility, industry, and academic interests serving the seven-county, Minneapolis-St. Paul metropolitan area - the MetroGIS community.

Use of a Return on Investment (ROI) methodology developed by Geospatial Information & Technology Association (GITA) was a requirement of receiving the cited Category 5 NSDI CAP Grant funding. Information publicly available about the method was reviewed by the MetroGIS QPV Study team prior to making applying for this funding. There was nothing in the publicly available information that stood out as incompatible with MetroGIS's study objectives.

B) METHODOLOGY REVISED – GITA ROI FOUND NOT APPROPRIATE FOR METROGIS OBJECTIVES

After the MetroGIS QPV Study Support Team (Study Team) invested significant time and effort from early-June to mid-September 2010 to deploy GITA's ROI method, we arrived at a position in the study where we had more questions than answers.

On October 8, 2010, the Study Team shared its experience with GITA leadership.³ Two topics were discussed: options to overcome the unavailability of the detailed time and cost data needed to complete the ROI Worksheets for the component of the study internal to Hennepin County. No workable alternatives were identified. GITA leadership also concurred that its ROI methodology was not a good fit for the external component of MetroGIS's proposed study because measuring the public value of data sharing does not involve development/implementation of a specific deliverable (e.g., application, dataset, system enhancement). In Attachment A, Francis Harvey, Research Coordinator for the QPV Study, provides an explanation of the issues encountered with the GITA ROI method when we attempted to use it to assess value realized internally to Hennepin County from geo-enabling of parcel data. Notwithstanding our inability to complete the GITA ROI worksheets, several qualitative examples of benefits realized from geo-enabling of parcel data were documented through this effort and are presented in Attachment A.

In December 2010, the NDSI CAP Grant Administrator⁴ authorized a one-year time extension to April 29, 2012 allowing the Study Team to pursue a locally devised methodology with the funds remaining in the original grant award.

From January through April 2011, the study support team collaborated with the MetroGIS QPV Study Advisory Team⁵ to devise a new methodology⁶ to act on MetroGIS's objective to understand public value that can be created when organizations participate in a geospatial commons. A high-level conceptual design was agreed upon in April 2011 which was

referred to as the “Defining Values” component of the MetroGIS QPV Study. The high-level conceptual design is presented in Attachment B. Also included in Attachment B are key components of the Request for Proposals published in June 3, 2011 seeking a contractor to assist with moving from a concept design to an operational study method. Professor John Bryson, Hubert H. Humphrey Center of Public Affairs, University of Minnesota, was awarded the contract in August 2010.

C) OVERVIEW OF RESULTS – RESCOPED STUDY

The components of the rescoped MetroGIS QPV Study were named “Defining Values” and “Defining Parcel Data Value”. Although both components provide valuable insight and solid foundation for subsequent work, neither was able to drive beyond qualitative descriptions of public value that can be expected to be created when organizations openly share geospatial data and related resources. An overview of each follows.

1) “Defining Values” Component: Considered the matter of value from policy makers’ perspectives. Policy makers participated from the following five communities of practice that serve the Twin Cities metropolitan area:

- 1st Responder/Emergency Management
- Business
- Government
- Non-profit
- Utility

(a) Working Purpose Statement: Conceive of and test a methodology designed to identify values and capacities (business drivers) critical to accomplishing cross-sector collaboration – the foundation for understanding public value creation opportunities.

(b) Study Design and Expectations: Professor John Bryson, University of Minnesota, was retained to conduct this study. The Study Team believes decision-makers make decisions to support GIS related services more from a perception of general public value rather than a specific economic analysis of a financial return on investment (as long as the dollar amount of the investment is modest in comparison to their normal budgetary considerations).

As such, the goals of the “Defining Values” component were to discover and document, according to major stakeholder type:

- Public benefit theme categories that decision makers might use in determining and evaluating public value creation potential (as a result of parcel data placed in the public domain).
- Information/presentation approaches that support staff would need to make a case for public value benefits deemed to be meaningful by decision makers.

The Study Team agreed on the high-level methodology presented in Attachment B to catalyze development of a final methodology for this “Defining Values” component study. A core principal that was recognized in the high-level design was a preference for a focus group centric method that targeted policy makers and senior executives who represented distinct communities of practice serving the seven-county, Minneapolis-St. Paul metropolitan area.

A key assumption of the Study Team was that each community of practice (stakeholder group) was likely to have a different set of values and priorities. The

methodology needed to provide a means to understand how they compared and contrasted. The Study Team also recognized a need to understand if the various communities of practice supported MetroGIS's objective to seek out cross-sector partnership opportunities to address shared information needs.

The final major outcome sought of this "Defining Values" component study was to identify benefit streams that should be targeted for measurement. The Study Team believed that the way to achieving this outcome required an understanding of the broad types of information needed "to make a case for public value benefits viewed as most meaningful to policy makers". This information could, in turn, then be used to measure relative importance of each category of public value (benefit) potential that could be created if open access to parcel data were established. To the extent possible, the ultimate objective was to support a capability to quantify public value benefits recognized by each community of practice. This foundational information would subsequently be used by MetroGIS to act on the deliverable for the original QPV Study deliverable - "develop a methodology capable of quantitatively measuring public value (QPV) created when organizations actively participate in a geospatial commons."

(c) Major Take-Aways:

- 1) There appears to be a substantial overlap across the five, above cited, communities of interest in terms of organizational goals and interests and capabilities.
- 2) The cited overlaps in organizational goals and interests and capabilities provide insight into target areas for prospective partnerships to address shared preferences and needs.
- 3) There appears to be substantial agreement on the benefits of sharing data and information, other resources, and work. Again, the insight gained about specific valued outcomes of sharing geospatial data and related resources provides insight into prospective partnerships to collaboratively address shared interests.
- 4) The research method developed by our team (to discern goals, interests, desired capabilities, and the value of sharing) has provided a way forward toward realizing the sought-after ability to quantify public value created as a result of organizations participating in a geospatial commons. However, as anticipated when this effort launched, the ability to actually measure public value created, whether quantitatively or qualitatively, will require additional research. Circumstances noted above exacerbated issues that the research method had to tackle.

The anticipated follow-on research should be guided by the following objectives:

- Delve into the findings of this Phase I study to define clear targets/opportunities for cross-sector partnering and a framework for testing the prototype methodology.
- Explore further means to measure public value created, as perceived by the stakeholder, when organizations participate in a geospatial commons.
- In addition to measuring benefit, the Quantify Public Value methodology should also provide a means to measure stakeholders' relative ability to take risk.

- (d) Process and Detailed Results: Five focus groups were conducted by Professor John Bryson between October 14 and November 30; one for each of the following five communities of practice noted above. Bryson also facilitated a sixth large group

event on December 1 at which representatives of the five previous community of practice focus groups participated. The participants met as a combined group to explore commonalities in values shared across the five communities of practice.

A detailed description of the facilitation process and the results of each focus group are presented in Attachment C, Summary Report - Defining Values Study. The major findings were as follows:

- 1) There appears to be a substantial overlap across the five cited communities of interest compared in terms of organizational goals and interests and capabilities seen as important for facilitating achievement of the cited goals and interests. Specifically, the combined focus group believes the **public** most values the following **goals and interests** (see *Word Map in Figure 1 on next page*):

- Providing reliable service at reasonable cost
- Ensuring public safety
- Providing effective, efficient, quality services
- Ensuring better decision making for public and private benefit
- Improving the quality of life
- Helping develop a stronger local economy
- Ensuring physical infrastructure is developed and maintained

- 2) In terms of **capabilities** needed to achieve the goals and pursue the interests listed in Item 1, the combined focus group believes the **public** most values the following statements:

- Understanding needs and expectations of citizens
- Responding by leading and adapting to any situation
- Effective executive leadership
- Communicating and interacting effectively
- Accurate data
- Effective implementation and action (“Do”)
- Ease of access to information

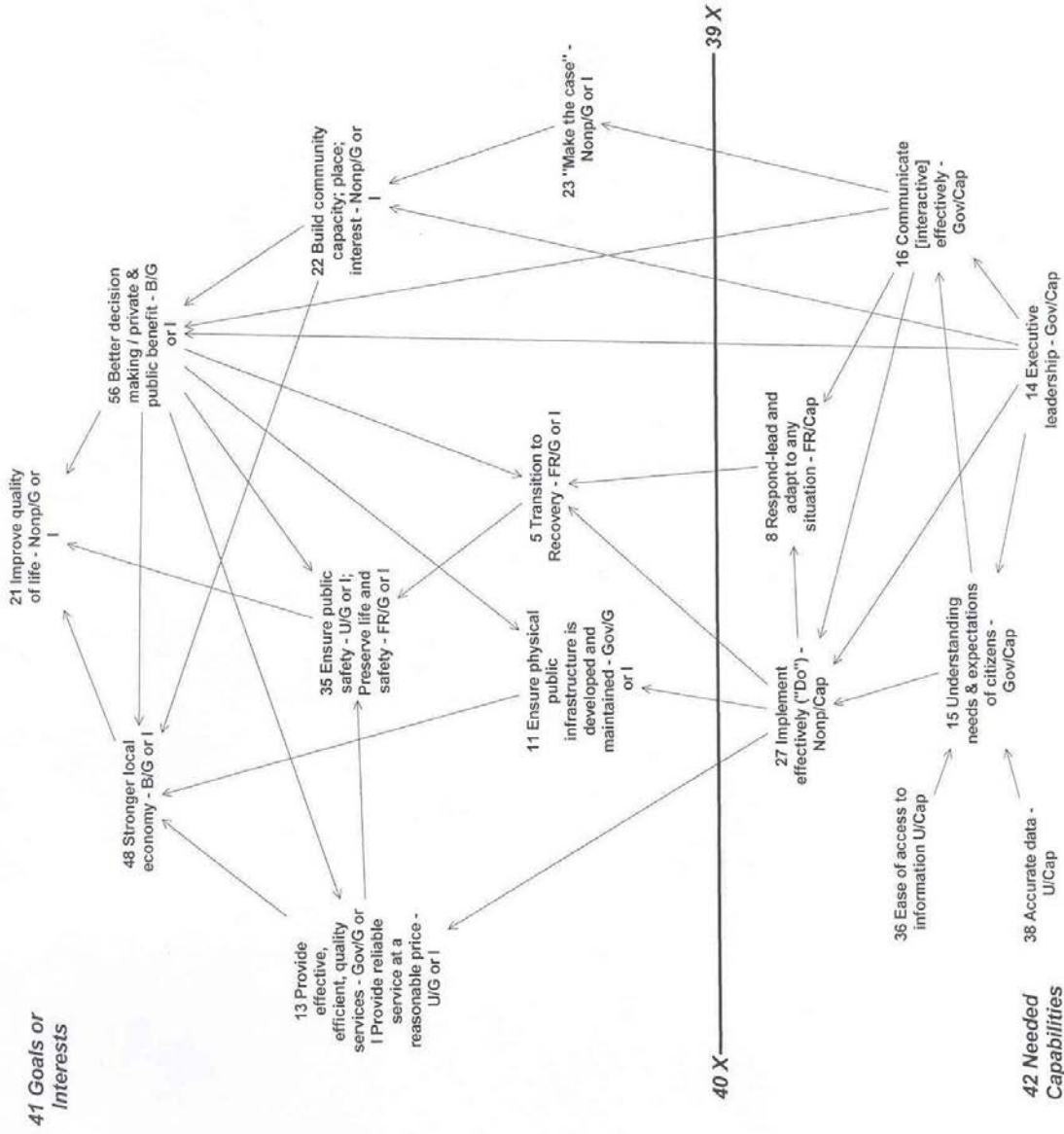
- 3) There appears to be substantial agreement on the benefits of sharing data and information, other resources, and work. The combined focus group believes that the following are the **major benefits of sharing data and information**:

- Better decision making
- Accuracy
- Data accessibility and availability
- Cost saving and cost sharing
- Timely data
- Improved data standards

- 4) The combined focus group believes the following statements represent the major values to be gained by **sharing other resources**:

- Greater connectivity, collaboration, and alignment
- Cost savings and cost effectiveness
- Flexibility to do other things, one of which is to innovate
- Improved data accuracy
- Increased impact
- Increased organizational and project viability

Figure 1. What the Public Wants - Goals and Capabilities



- 5) The combined focus group believes the following represent the major values to be gained by sharing work:
- Better decision-making
 - Cost efficiency and cost effectiveness
 - Better products and services
 - Better understanding, planning, governance, and attractiveness to businesses
 - Innovation as a result of sharing
 - Finding and sharing best practices
 - Facilitation of policy-based discussions
- 6) The research method developed for this study (to discern goals, interests, desired capabilities, and the value of sharing) provided a way forward toward realizing the sought-after ability to quantify public value created as a result of organizations participating in a geospatial commons. However, as was anticipated when this effort launched, the ability to actually measure public value created, whether quantitatively or qualitatively, will require additional research.

The anticipated follow-on work should be guided by the following objectives:

- Delve into the findings of this Phase I study to define clear targets/opportunities for cross-sector partnering and framework for testing the desired methodology.
- Accomplish the original goal of providing a means to measure public value of sharing, as perceived by the stakeholder.
- In addition to measuring benefit, the sought-after methodology should also provide a means to measure stakeholders' ability to take risk.

2) "Defining Parcel Data Value" Component: Francis Harvey, MetroGIS QPV Study Research Coordinator, conducted a survey of currently licensed users of the MetroGIS Regional Parcel Dataset September 2011, as a supplement to the Defining Values Study component, described above.

(a) Working Purpose Statement

The purpose was to improve understanding of the business needs that drive stakeholder use of this dataset and the value/benefit they attribute to using it. To do so, it focused on the user's perception of the value of sharing parcel data and the role of parcel data in addressing business needs.

(b) Major Take-Aways:

- 1) The results suggest an interesting conundrum related to use and value of the MetroGIS [Regional Parcel Dataset](#): parcel data is important; it is used everywhere but ultimately remains just a small part of the data people use regularly.
- 2) A large group of respondents indicated the value of access to parcel data is substantial. The majority of responses indicate the access to the Regional Parcel Dataset lies in the 'necessary' category for their business activities.
- 3) Many respondents indicate they cannot assign a monetary value to their use of regional parcel data. Most responses to the question about the value of using the regional parcel data set indicated the users could not assign a value.
- 4) These findings support the need for further research to examine specific activities, causes, uses, and processes to improve our understanding of how (public) value is created through data sharing.

(c) Study Design and Expectations

Harvey carried out his component of the rescoped study via an online survey of individuals who represent organizations (government and academic) currently licensed to use the [MetroGIS Regional Parcel Dataset](#) to support their business operations. This survey was meant to complement Professor Bryson's Defining Values Study, with the aim to improve understanding of the business needs that drive stakeholder use of this dataset and the value/benefit they attribute to using it.

The idea for this supplemental survey arose during discussions QPV Study Advisory Team⁵ about problems that the QPV Support Team encountered while attempting to administer the originally required GITA ROI methodology. (See the [fall 2010 Quarterly report](#) for more information about the problems encountered.) A critical component was the Study Team's realization that existing government accounting and documentation systems are not designed to capture information needed to offer insights into value accrued from use of geographically-referenced parcel data.

D) ADDITIONAL RESEARCH NEEDED

The Study Team believes that more research is needed to better understand the fundamentals of value creation before the findings described herein can be used as targets to which to design actual cross-sector collaborative projects (test beds); projects perceived to have high potential to create public value be it through sharing of geospatial data or related resources. Conceptually, the additional research would:

1. Determine how people connect costs and benefits as value in work with shared geospatial data and establish measures for the important dimensions of the shared goals, interests, capabilities, and benefits of sharing. These measures could also be of assistance to:
 - (a) Document to what degree MetroGIS is helping – directly and/or indirectly – the constituent communities of practice achieve their goals and interests, maintain or develop the capabilities they need to achieve their goals and interests, and realize the benefits of sharing data and information, other resources, and work.
 - (b) Inform efforts to fine-tuning existing MetroGIS strategies and develop new strategies
2. Validate the results by engaging larger, more completely representative focus groups in each of the community of practice areas.
3. Verify the face validity of the key concept maps produced as part of this research (Figures 1 – 7). These maps represent **potential logic models** underpinning creation, development, maintenance, and performance of a geospatial data commons.

E) TOTAL RESOURCES CONTRIBUTED

- 1) Grant Eligible Expenses: \$40,048.24 in grant-eligible funds were incurred in the course of carrying out the subject study or 80.1 percent of the \$50,000 grant awarded to this project. Following the realization that the GITA ROI method would not work for our needs, the Study Team understood that a quantitative model was no longer possible with less than \$30,000 remaining in the grant award. The Study Team sought and received permission to pursue a rescoped study to utilize the limited funds remaining, to the extent practical, to provide a foundation for subsequent work toward the accomplishing the goal of the originally proposed study - quantify public value creation as a result of wide spread participation in a geographic commons.
- 2) In-Kind Contributions: As of March 24, 2011, our in-kind contribution was valued at \$54,808.74 or \$15,558.74 (139.6 percent) more than our obligation of \$39, 250 in in-kind contributions. This fact was shared the NSDI Grant Administrators and along with approval of a time extension to April 29, 2012, they authorized our team to stop tracking in-kind contributions, given that our pledged obligation had been significantly exceeded.

Other additional in-kind contributions that were easy to track exceeded a value of \$80,531 or in excess of 205.2 percent of the amount pledged:

- MetroGIS Staff Coordinator's time from March 2011 recorded on weekly time sheets (valued at \$14,448).
- Time contributed by the participants in the six focus group events held October 14 through December 1, 2011 (valued at \$9,875).
- Time contributed by the QPV Study Advisory Team members to participate in the April 25, 2011 and January 4, 2012 meetings (valued at 1,400).

END NOTES:

- ¹ Objective #B8 in the approved application for the NSDI CAP Grant awarded to the originally proposed MetroGIS QPV Study.
- ² As reported in our [fall 2010 and winter 2011 project summary reports](#), our original project encountered significant, unforeseen issues beyond the control of our study team. As a result, a one-year time extension was granted through April 29, 2012 to permit our team to pursue an alternative study in line with our original objective.
- ³ On October 8, 2010, Robert Samborski, GITA President, and two individuals who were members of the GITA ROI development team – Dave DiSera and Nancy Lerner -participated in a conference call with the MetroGIS QPV Task 1 Study Support Team.
- ⁴ The MetroGIS Staff Coordinator met with Milo Robinson, Cat 5 NSDI CAP Grant Administrator, on December 8, 2010 while in Washington D.C. attending a National Geospatial Advisory Committee meeting. The issues encountered with use of the GITA ROI method were shared with Mr. Robinson, including the GITA officials' conclusion that the GITA ROI methodology was not appropriate for MetroGIS's objectives. Robinson agreed to grant a one-year extension but declined our team's request to reinstate at least some of the nearly \$17,000 in grant funding that had been expended to deploy the GITA method. Rather, Robinson invited Johnson to participate in the evaluation of the 2011 applications to facilitate the potential of partnering with others who may have similar study objectives. Johnson agreed to do so.
- ⁵ The members of the MetroGIS QPV Study Advisory Team are: David Arbeit, GIO State of Mn; Terry Schneider, Chair of the MetroGIS Policy Board and Mayor of Minnetonka; Rick Gelbmann (Metropolitan Council); Randy Knippel (Dakota County); Gary Swenson (Hennepin County); Larry Charboneau (NCompass), Will Craig (University of Mn – CURA), Peter Henschel (Carver County), Laura Kalambokidis (University of Mn – Applied Economics), Steve Swazee (Shared Geo), and Sally Wakefield (Envision Minnesota). Staff support: Professor Francis Harvey, Study Research Coordinator and Randall Johnson, MetroGIS Staff Coordinator, Study Administrative Coordinator.
- ⁶ Notwithstanding the issues encountered to deploy the GITA ROI methodology, the MetroGIS QPV Study Team had concluded there was value in moving forward with the originally proposed Task 3 analysis (outward looking component) even though the results would not be able to be quantifiably measured against Hennepin County's internal operational costs and benefits (Task 1), as originally proposed. The team reasoned that understanding creation of public value is the main focus, which is not limited to value realized by Hennepin County, whether in qualitative or quantitative terms.

ATTACHMENT A

Task 1 Summary Report - MetroGIS Quantify Public Value (QPV) Study (Why GITA's ROI Methodology Found Inappropriate for MetroGIS's Objectives)

October 16, 2011

Prepared By: Francis Harvey, Research Coordinator - MetroGIS QPV Study
[in collaboration with Danielle Scarfe, W4ASight, and Randall Johnson, MetroGIS]
2010 NSDI CAP Grant - Category 5 Award

Overview

The Quantify Public Value (QPV) FGDC-CAP supported project began with a Return On Investment study, following the GITA ROI approach, detailed at a workshop, and related materials provided to the QPV project team. The approach was applied, as planned, to collect and analyze data connected to parcel-related activities within the Hennepin County Government. After establishing contact with the county government, staff from W4Sight sent emails and made phone calls to Hennepin County staff to collect relevant information. This data collection included a series of ten interview sessions over three days (July 19-21) at the Hennepin County Government Center to finish the data collection and meet with county staff to address open questions. Valuable data was collected, but substantial limitations arose from the unavailability of information on the use of parcel data in the granularity called for by the ROI approach. With only partial cost and benefit data for 7 of 8 county agencies interviewed, we were unable to produce reasonable estimates of benefits and costs even using interpretative interpolation following the GITA ROI approach. The dearth of concrete facts limited our ability to state any aggregated cost or benefit numbers with reliability. The findings of this Task 1, the analysis results, and assessment leave a number of open issues.

Task 1 Outcomes

The purpose of Task 1 was to assess, following the GITA ROI approach, the existing return on investment achieved internal to the County through its Parcel/GIS operations. The Quantitative Analysis conducted used data gathered from the interview process related to labor costs, infrastructure, and revenues. In this approach, benefits should be determined through a variety of means, mainly different calculations using measures collected during interviews. However, much of the data described in the GITA ROI model was either not accessible or not possible to obtain during task 1. For example, during the interview process, county staff were not able to provide comprehensive or accurate statistics on the number of people in their department using the parcel data, the amount of time they spent using it, or in what way parcel data are being used.

This missing critical information resulted in major gaps when attempting to complete the ROI. The study team concluded that in order to clearly define the limitations of the information gathered, general assumptions would need to be generated to realistically assess benefits and costs related to the current parcel/GIS environment at Hennepin County.

This section summarizes the study team's assumptions and offers valuable qualitative, not quantitative, insight into benefits and costs. It is important to recognize that these assumptions must be considered when developing the proposed Quantify Public Value (QPV) methodology.

Assumptions:

- Metrics to determine parcel usage and business improvements associated with its use are not available for analysis. The majority of County staff were only able to provide percentages of this time for the current use of GIS and/or the parcel data.
- The automation of the parcel data has been a great benefit for its users by eliminating the need for paper maps and filing.
- The completeness, currency, and accuracy of parcel data have led to better business decisions by county departments.
- The public receives better service through access to parcel data on the county's external interactive mapping application.
- Public inquiries to the County departments have dropped since parcel data has been put online.
- The use of parcel data is considered to be a critical and integral part of county business activities.

Costs:

- Connectivity issues with the SDE server with parcel data causes division/division/units to copy the parcel data onto their own department servers or personal computers.
- Many of the division/division/units keep parcel data or data that are derivatives of parcel data on their individual computers or servers. This does not allow other departments to take advantage of this derivative data.
- Many other datasets that would be useful when overlaid on the parcel data are not currently available on the external website. Publishing of this data would significantly reduce public inquiries (i.e. crime locations, flood zones, etc).
- Certain division/units are beginning or are in process with their own GIS/Parcel-related initiatives without coordination with the central GIS unit (i.e. Survey/Graphic unit's own parcel data public website and the Assessor's GIS-based Assessment Application).
- Cross division/unit coordination and collaboration of collective knowledge between the Surveyor/Graphics Unit and the Enterprise GIS Unit has affected creation of parcel editing standards and business rules.
- Parcel data is perceived by Housing Community Works & Transit engineering division/units as not accurate enough for their business needs (as related to parcel "area"). Engineering drawings have been maintained in Microstation for many years and have not been migrated to a GIS format because of this perception of inaccuracy. Some of this situation may be due to lack of understanding among these groups; when stated that the Survey/Graphic division uses coordinate geometry, a method by which features are defined through input and bearing and distance measurement from the surveyors' original engineering drawings to calculate precise locations, they were unaware. The result of the use of Microstation, instead of viewing it through the GIS, creates conflicts with viewing the most current parcel information available.
- Integration of RecordEase with GIS does not exist causing decreased productivity when trying to relate parcels to documents stored in the RecordEase application.

Benefits:

- Parcel data is used by many departments for reference or development of "proximity" datasets.

- Ease of accessibility to data is very beneficial to business activities for all departments with parcel-related activities, creation of exhibits for internal or public use, and answering public inquiries.
- Parcel data is the cross-departmental default standard for geocoding all GIS data.
- Research time related to Parcel Identification Numbers (PIN) and/or address ownership records has been cut immensely through deployment of the County's internal/external web-based parcel application.
- Use of parcel data in the public website has decreased public inquiries to most departments (i.e. Property Tax/Property Identification Unit used to receive 3-4 calls per day, now may receive one call per day).
- Analysis with parcel data and actively merging it with other datasets allows for better decision making and in some cases generates revenue or saves the county in land acquisition costs (i.e. avoidance of auctioning forfeited land that will be needed later for a Capital Improvement Project).
- The use of geo-enabled parcel data has eliminated the need for the production and use of paper map books.
- Geo-enabling parcel data has allowed for speed and development of professional-looking map products.
- The use of parcel data in the GIS-based Assessor Mobile (PKG) applications has improved efficiency in the 60,000 plus appraisals completed each year. GIS-based applications include: 1) Inter/Intranet Property Map, 2) Mailing Labels, 3) Community Works & Transit Desktop application (which was given only to certain staff and other still need it), 4) Assessor map, 5) Assessor Mobile (PKG), and 6) Tax Forfeit Mapper. The interviews did not provide sufficient indication how each application is benefiting activities.
- For example, the Assessor appraisal field staff have been reduced in number, parcels appraisal contracts have risen, and coordination and communications have improved with the use of the their Mobile Field Inspection application.
- Improved coordination and communication within divisions/units, cross departmentally, and with external agencies through the use of parcel-related mapping (and use of exhibit maps). Examples are as follows:
 - Appraiser parcel completion maps have assisted in determining where appraisers are needed and assists to efficiently and quickly redistribute field staff when necessary.
 - Sales ratio mapping using parcel data identifies where city appraisers may not be meeting legal guidelines which prevents lawsuits later.
 - Parcel ownership information and location is used to assist in the warrant and parole searches as well as in preparation for serving warrants.
 - Parcel valuation data is mapped to incident areas are used to estimate damage for disaster declarations (federal funding). Ease of this process allows for faster acquisition of those funds.
- GIS activities are used in the planning and design of the county transportation routes and parcel information provides proximity information.

Benefits and Costs Analysis:

With the data collected we could not prepare a conclusive quantitative benefits and costs analysis. Our team could not conduct the analyses or reliably attempt calculations due to the lack of data. Subsequently, our team has initiated communication with Nancy Lerner, Dave DiSera and Bob Samborski, who each played substantive roles in development of the subject

ROI methodology, to share with them obstacles we encountered and seek their advice for subsequent phases of this study.

Our thoughts concerning application of the GITA ROI approach to the study of a large and complex county level organization are characterized as follows. Based on the work of Hennepin County staff with parcel data, our study results provide evidence of \$132,500 benefit for two positions in the surveying/ graphics unit. However, this is a 'gross' benefit. The 'net' benefit, following the GITA approach, would have to consider the actual improvements in staff productivity or reductions in time spent on tasks due to spatial data investments. The total costs for developing the parcel data, software and hardware costs, are \$54,264. To reiterate: these two numbers, by themselves, do not allow a comparison, nor should we attempt partial analysis with roughly only 1/3 of the data required, but they do start to allow us to anecdotally grasp the scope of costs and benefits of Hennepin County's efforts to geo-enable parcel data.

Exhibit 1 - Issues to Consider in Application of the GITA ROI Approach

Drawing on our experiences with Task 1 from the QPV study, we surmise several points for guiding further work on refining the proposed Quantify Public Value (QPV) methodology to prepare more robust quantitative analysis.

Missing data, accounting and budgeting

Obtaining data on proportional staff time spent on GIS activities can be very complicated and time-consuming to determine, even approximately. In addition, costs and benefits are hard to determine as most financial data is associated with positions, not with project time spent working with data. Estimates of time to acquire data cannot be too conservative in large multi-agency organizations. Project management should define a milestone when to freeze activities and await the availability of data.

Calculation of costs and benefits

At this point in time, we conclude from experiences that it may be advisable to arbitrarily set a Year 0 and determine the impact of investments and changes by determining costs and calculating benefits for the following years. For instance, Year 0 could be the year prior to a large internal re-organization, and the ensuing years would follow as Year 1, Year 2, etc, up to the current year. After costs have been accounted for (so-called sunk costs) they should not be considered in the ROI determination, although their value may be still not be assessed when the ROI analysis begins.

Analysis

The value of the analysis depends on the data that are able to be collected. While costs and benefits can be assumed, guessed, and estimated, it is important to document the reliability and source of the data as well as provide discussion with an overview of the general and specific reliability of calculations and data.

Exhibit 2 - Suggested cost-benefit calculation

The projects for which cost-benefit analysis are conducted in most cases involve some calculations. Each is prone to particular biases. However, a key calculation, because of its simplicity, is the determination of annual benefits.

As we understand this calculation from material produced by GITA documenting their ROI model (p. 28f of the workbook), annual benefits (AB) are determined by subtracting the annual internal labor cost (AIL), and any one-time labor costs (OLC) for that year from the total benefits (TB) for the year.

$$AB = TB - AIL - OLC$$

Costs for longer periods can be distributed to individual years. The simplest way is to divide the cost by the number of years, but other approaches, based on known factors or understood factors can be used to distribute the costs.

The results of the annual benefits calculations can be aggregated to provide information about total benefits. This can be done by multiplying a single year's costs by the project life, or determining the benefits for each year of the project's life and calculating the total.

As application of the methodology in our case (MetroGIS QPV Study) does not involve a "project" but rather an operational, cross-sector system of data sharing, for which our team is attempting to define current not future benefit, completing the calculation for future costs and benefits is not possible with the data and information obtained from Hennepin County staff., nor is it likely we shall have this data within the scope of the project.

ATTACHMENT B

Scope of Work Redefined QPV Study

RFP Published

MetroGIS published a Request for Proposals on June 3, 2010 seeking to retain a contractor with proven expertise to lead the newly defined “Defining Values” component of the MetroGIS Quantify Public Value (QPV) Study.

Context Provided for Prospective Proposers

MetroGIS is a regional spatial data infrastructure (SDI) serving the seven-county, Minneapolis-St. Paul metropolitan area (region). Participants include representatives of local, county, regional, state, and federal government entities serving the region, as well as private industries, utilities, non-profits, and educational institutions. MetroGIS’s principal focus is to implement solutions to shared geospatial needs of the over 300 local and regional government interests that serve the region. Local and regional government interests recognize that substantial further efficiencies are possible if partnerships with non-government interests, which have like needs, are also able to be realized.

Through the subject QPV Study, MetroGIS is attempting to develop a methodology to document and measure public value creation through the sharing of geospatial data, in particular, geographically-referenced parcel data. A federal grant was awarded for the MetroGIS QPV Study because there is no known methodology to accomplish this objective.

Role of the “Defining Values” Component

The MetroGIS Study Support Team (Study Team)⁴ believes decision-makers make decisions to support GIS related services more from a perception of general public value rather than a specific economic analysis of a financial return on investment (as long as the dollar amount of the investment is modest in comparison to their normal budgetary considerations). Successful completion of the “Defining Values” component is, therefore, critical to the success of the larger MetroGIS QPV Study.

The goals of this “Defining Values” component are to discover and document, according to major stakeholder type:

- Public benefit theme categories that decision makers might use in determining and evaluating public value creation potential (as a result of parcel data placed in the public domain).
- Information/presentation approaches that support staff would need to make a case for public value benefits deemed to be meaningful by decision makers

The Study Team agreed on the high-level methodology presented in Exhibit X to catalyze development of a final methodology for this “Defining Values” component study. A core principal is that the preferred method is focus group centric, with the participants representing a wide variety of government and non-government interests that serve the geographic extent of Hennepin County, in particular interests that currently cannot access parcel data without paying a fee.

A key assumption of the Study Team is that each stakeholder group is likely to have a different set of priorities and it needs to understand what those priorities are and how they differ. The

Study Team also needs to understand how the various groups relate to MetroGIS's objective to seek out partnership opportunities to address shared information needs. Finally, another outcome sought of the "Defining Values" component study is to identify those benefit streams that should be targeted for measurement. The Study Team believes that this outcome will be created by understanding the broad types of information needed "to make a case for public value benefits viewed as most meaningful to policy makers". This information would, in turn, be used to measure relative importance of each category of public value (benefit) potential that could be created if open access to parcel data were established. To the extent possible, the ultimate objective is to support a capability to quantify the differences among public value benefits by stakeholder organization type. This foundational information would then be used by the Team to act on the deliverable for the broader QPV Study deliverable - "develop a methodology capable of quantitatively measuring public value (QPV) created when organizations actively participate in a geospatial commons."

High-Level Methodology

On April 25, 2011, the MetroGIS QPV Study Advisory Team endorsed the following high-level methodology for the subject "Defining Values" component of the broader MetroGIS QPV Study.

Following agreement on the specific stakeholder organizational types that comprise focus groups, the general approach for obtaining useful information from decision makers and support staff on factoring in "public value" for GIS services is defined below.

Identify one key individual in each stakeholder group that would act as a co-facilitator and contact to other key individuals in that stakeholder group. This individual would also assist in critiquing the initial questions to start the discussion. (See the reference above pertaining to the formatting of the questions.)

Step 1. Agree on the stakeholder groups for which focus groups will be hosted. The Team's preliminarily approved focus groups are as follows:

- State agencies/Regional governance
- County/City/School District
- Public Utility
- Real estate/development
- Consulting (civil, surveying, traffic, demographic, market research etc.)
- Non-profit
- Business community (Chamber of Commerce, major employer, regional economic development agency etc.)

Step 2. Identify key individuals within each group that would volunteer to serve as a co-facilitator, assist in developing initial questions tailored to that group, and assist in interpreting the business needs and feedback from the focus group. This individual would also assist in inviting between 5 and 8 other members of the stakeholder group (approximately half being decision makers and half being staff members).

Step 3. Have our consultant and stakeholder volunteer develop a set of questions tailored to that specific stakeholder group. The questions will attempt to identify what the primary motivators are that allow the decision makers to recognize the public value of GIS related efforts and what information or resource materials would best be utilized by staff to communicate that public value benefit. The questions would be designed to provoke thinking and free flowing discussion of the focus group members and secondarily to solicit specific factual data.

Step 4. Select and invite up to 8 other stakeholder group members to a two to three hour focus group meeting, potentially at a location familiar with that focus group.

Step 5. Conduct the focus group meetings, with each session potentially being recorded to allow for capture of key comments after the meeting rather than distracting the facilitators with trying to maintain accurate notes of the meeting.

Step 6. Prepare a summary report of the findings from the stakeholder focus groups. The report should identify common themes that may emerge on evaluation criteria used to determine public value and the types of public value items generate the most willingness to invest in GIS data and services. The resulting report is to focus more on the identifying the types of information/data that create the best understanding of the public value for the level of investment for each stakeholder group and how they can best be presented. Connections to return on investment issues are desired but not required.

ATTACHMENT C

Summary Report - Defining Values Study

Note: Due to its length (74 pages), the Summary Report for the MetroGIS Defining Values Study component of the MetroGIS QPV Study has not been incorporated into this report.

The cover sheet follows. The complete report can be viewed at:

<http://www.metrogis.org/projects/index.shtml#ProjectQPVS>

MetroGIS Quantify Public Value (QPV) Study “Defining Values” Component

January 4, 2012

Submitted to MetroGIS by the Consultant Team of:

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2010 NSDI CAP Grant Category 5
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ATTACHMENT D

Study Report - Defining Parcel Data Value Study

November 21, 2011

Prepared By: Francis Harvey, Research Coordinator - MetroGIS QPV Study
2010 NSDI CAP Grant - Category 5 Award

Executive Summary

The intention of this survey is providing supplemental information specifically related to parcel data to Professor Bryson's "Defining Values" research. The results help to gain more insight into actual uses and values of regional shared parcel data and establish clearer issues for quantitative approaches to identify uses and values in this project and afterwards. This emphasis arises from discussions with advisors to the QPV project following the realization that existing accounting, documentation, and ROI methods fail to offer insights into the value arising in the use of data.

Relationship to Original QPV Study Objectives

From the partial results resulting in the GITA ROI study (Section B, main report) conducted for MetroGIS by W4Sight and subsequent discussions with the advisory team³, we know that strong evidence of value arising from the sharing of geographic information is crucial to policy makers. We have discussed the benefits of having more specific information about actual uses and values. The Defining Values research that Prof. Bryson is undertaking considers the matter of value from policy makers' perspectives and will also cover some aspects of actual uses and values. This complementary Defining Parcel Data Value survey supplements Professor Bryson's Defining Values research to gain more insight into actual uses and values arising in the use of regional parcel data. Further, it helps establish clearer understanding of the role of parcel data in spatial business needs as an input for future discussions about parcel data sharing. These results also hold relevance for broader discussions about all eight MetroGIS endorsed regional datasets.

Survey Method and Organization

The anonymous survey (Exhibit 1) consists of 17 questions on the use and value of MetroGIS parcel data to support functions of their respective organizations. All current licensees of the MetroGIS Parcel Data were invited to participate by email, with a follow-up email sent two weeks after the initial email. If the recipient knew of other individuals (both within and outside the organization) using the parcel data set they were encouraged to forward the invitation message to them. 44 respondents completed the on line survey which was developed and managed using SurveyMonkey. Another 7 respondents started the survey but did not answer all questions. The following discussion considers responses to individual questions. An assessment of completion rates and other factors follows an overview of the survey and presentation of responses.

The survey includes questions related to three issues:

- 1) The first part of the survey raises questions about the individual's background, role, and the sector of the agency/company they work for.

- 2) The second part of the survey includes questions about the use of parcel data sets. What is the frequency of access? Do you process the data further? How frequently is it used? Do you share it within the organization? Do you share it outside the organization? Which business needs does parcel data help fulfill? What proportion of the organization's work involves parcel data?
- 3) The concluding section consists of questions dealing with if and how they are able to assess value (of using data produced by others to their organization) through qualitative and quantitative measures.

Overview of Responses

To understand the characteristics of respondents, the survey began with several generic questions. These responses can aid the interpretation of the results and put them into context with the larger population of GIS users and developers in the Metro area. Of the respondents 65% completed a bachelor's degree, 47% completed a masters degree, and 14% a PhD. ESRI training had been completed by 26% of all respondents. Interesting is the almost perfect split between people who completed degrees with GIS emphasis and those without (51% and 49% respectively). About 42% work in technical areas and roughly 1/3 work as analysts and 1/3 works in management. Of all respondents, 9% indicated they are programmers. The majority of the respondents work for regional

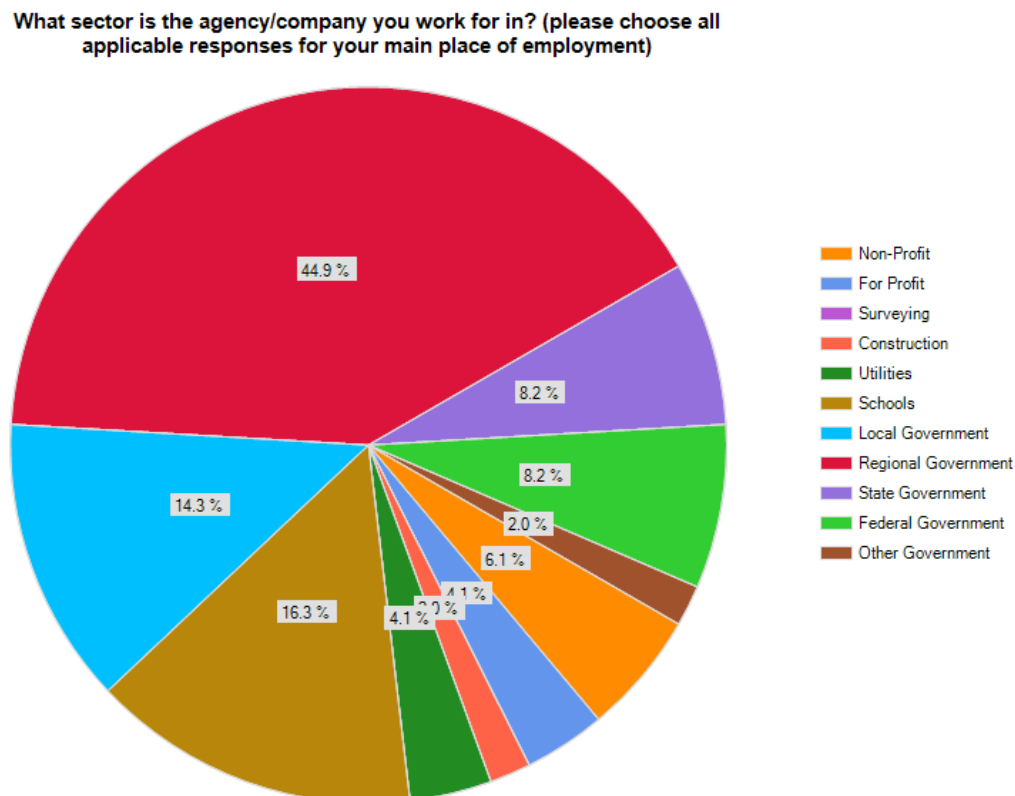
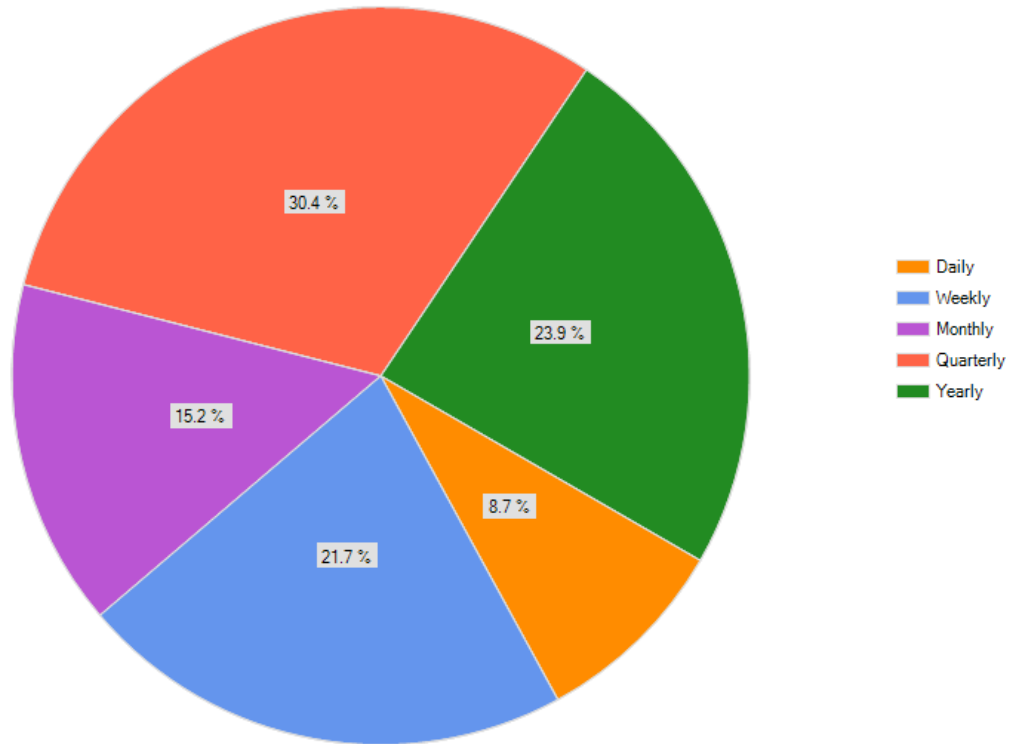


Figure 1: Sectors represented in survey responses

**What is the frequency of your access of parcel data from MetroGIS?
(including updates in the last years)**



How frequently is it the data used in your organization?

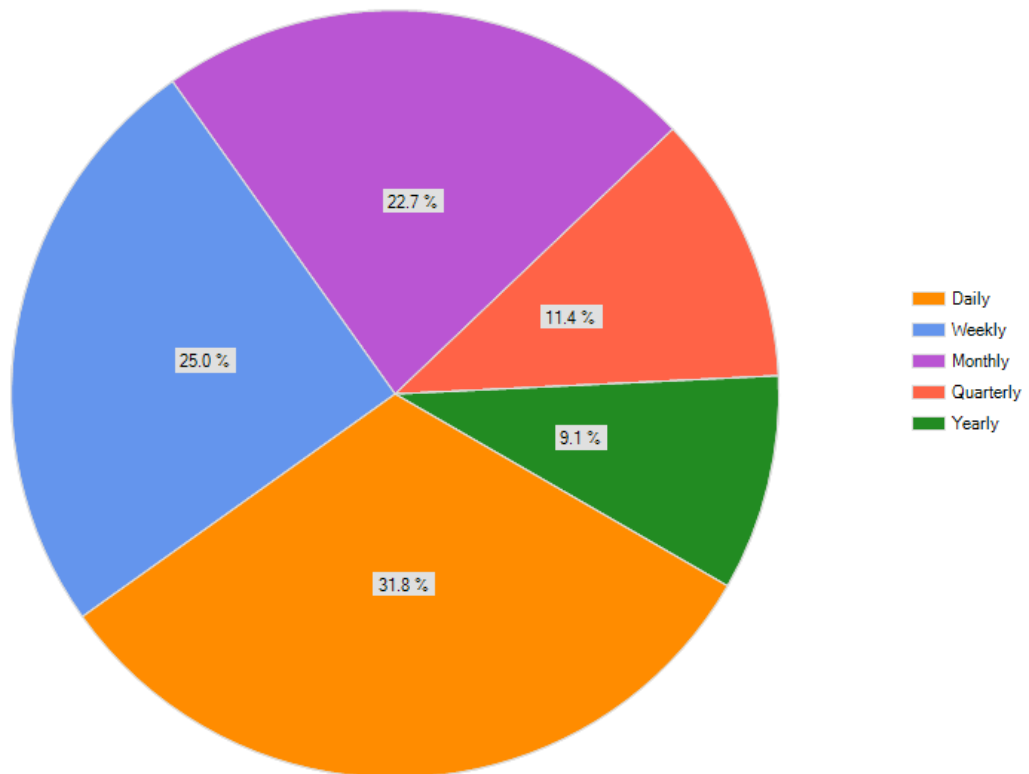


Figure 2: Access and use of parcel data

government agencies, followed by school districts and local government. No surveyors responded to the survey (see figure 1).

The results suggest an interesting finding related to the use and value of the regional parcel data: parcel data is important; it's used everywhere but remains a small part of the data people use regularly. The frequency of access suggests a broad range of regional parcel data use. Most respondents receive parcel data quarterly (30%) followed by yearly (24%) and weekly (22%). A smaller number access the data monthly or daily. Interesting to note is that 73% of the respondents process the data themselves. Staff process the data in most other cases, although some respondents indicate a state agency, students, or also no processing whatsoever occurs. In terms of the frequency of use, parcel data is used very frequently (see figure 2), suggesting wide-spread significance. Almost 32% of the respondents use the data daily; 78% use the data at least monthly. Although most respondents process the data themselves, an almost equal number (67%) share the parcel data within their organization and 25% share data or derivative products (maps, tables) outside the organization. The survey lacked questions to determine details of these activities.

The value of parcel data is related to activities that require information or visualizations of areas. The majority of respondents (45%) use the parcel data for business activities involving land use and/or planning. An smaller number of respondents (11%) use the data for education or business purposes. Surveying and E-911 work were additional uses. Several people failed to indicate clear business uses in their response, stating simply that parcel data is important. Interestingly, parcel data for almost 70% of the respondents makes up less than 30% of the data they work with. In fact, 30% of the respondents indicate their use of parcel data constitutes less than 10% of the data used by their organization and group works with.

In summary, the regional parcel dataset is important, yet is just a small portion of data used by respondents. Questions asking to assign a monetary value to the use of parcel data and the confidence in the estimation of value shed some insight. First, there are some caveats. Many respondents indicate they cannot assign a monetary value to their use of regional parcel data. An almost equally large group however, indicates the value is substantial. Most responses to the question about the value indicated they could not assign a value. The majority of responses position (see Figure 3) the regional parcel data as at least a 'necessary' data set for their business activities. In other words, parcel data holds considerable monetary value for around 38% of the respondents. Most respondents are confident in the category of value they selected to answer this question. And what is that value? Some respondents assessed value and confidence by considering the uses and roles of regional parcel data in business activities, even considering the time spent processing parcel data. Others used a comparison strategy, basing their assessment of value on the cost of acquiring parcel data from other countries. Other respondents found regional parcel data is essential and therefore invaluable. Finally, some respondents simply guessed at the value.

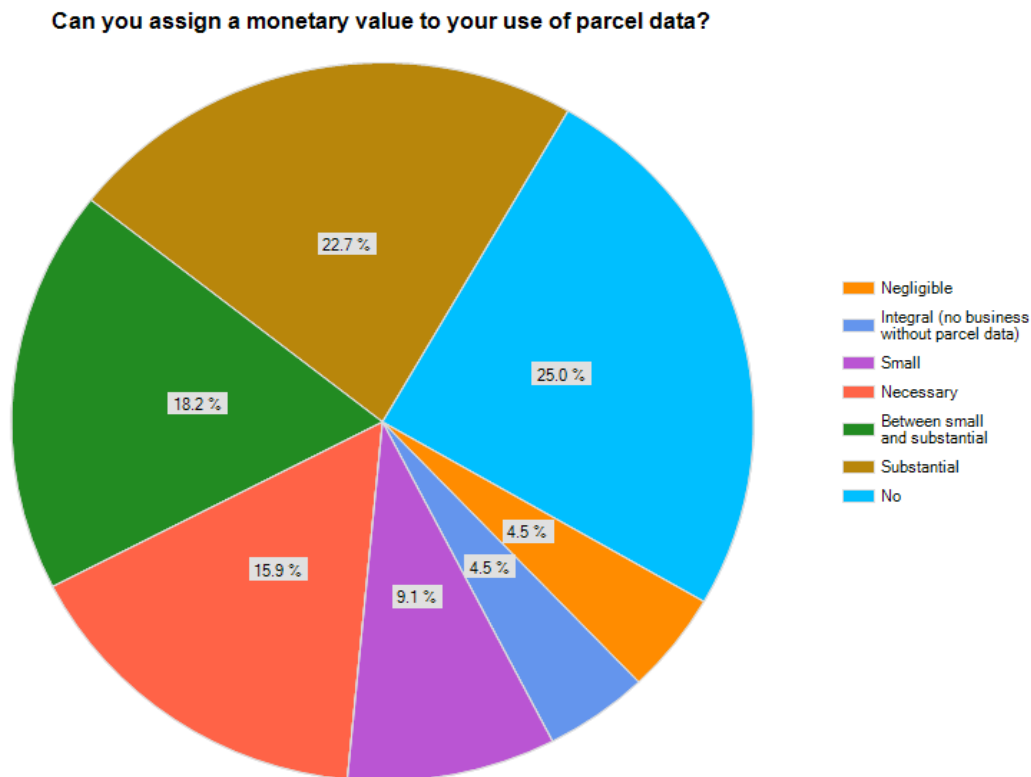


Figure 3: Estimates of regional parcel data value

In terms of the costs to access and process parcel data, most respondents indicated the cost of accessing and updating were very low and the costs of processing were as expected. Again, most were somewhat confident in their evaluation. More research would be required to determine specific monetary values.

Assessment

First, the response rate to this survey is satisfactory (30% of the contacted people fully completed a survey); a few additional respondents (3-7) actually skipped most questions. Questions involving writing and assessing contributions and confidence were systematically skipped by 13 or 14 respondents. The number of people skipping raises some concerns, but comments offered to these questions suggests that several possibilities for skipping them exist:

- staff working with GIS had better understanding of issues than the licensee completing the survey
- costs are difficult to assess because of the lack of accounting
- division of labor leads to respondents lacking insight to answer these evaluative questions
- internalization of parcel data processing effort is difficult to assess

In this regard, any detailed analysis of the survey results must reflect that individual assessments can be subjective. The corresponding limitation was considered in the design of the survey and accepted for two reasons. First, all of the revised QPV methodol-

ogy lacked the collection of detailed costs and benefit information. Second, a decision was made in designing the survey to generally ask questions that could have specific quantitative responses. The lack of specific financial information in other parts of the QPV study suggests that quantitative information is elusive and requires a more nuanced survey design and methods than the QPV project anticipated and could support.

While the survey did not return specific cost/expense related information, the results suggest that benefits of shared data are considerable. While only a few of the survey respondents (8.7%) access the regional parcel data daily from Metro GIS, 31% use the regional parcel data weekly and another 25% use it weekly. Bearing in mind that the regional parcel data makes up less than 10% of the organizations work for 30.4% of the respondents, it is clear that parcel data benefits a large number of business needs in the metro community. Looking forward, a research strategy to quantify benefits can begin with these results to target detailed work process studies of users with the goal of producing generalizable results for the larger community of users.

Finally it is worth noting that 59% of the respondent received the email invitation directly from Francis Harvey, survey manager. The remainder (41%) received a forwarded email invitation. This suggests a large degree of intra-organization division of tasks involving parcel data and communication among users of regional parcel data.

Exhibit

1. List of survey questions

EXHIBIT 1

Questions for Fall 2011 Supplemental Study Defining Parcel Data Value

Questions are divided into three sections. Altogether the survey consists of 17 questions.

Background

1. Did you complete a degree with an emphasis on GIS?
2. Please indicate your academic training?
3. What is your role in your main current employment?
4. What sector is the agency/company you work for in?
5. How did you receive this survey?

Use of Parcel Data

1. What is the frequency of access of parcel data from MetroGIS?
2. Do they process this data further?
3. How frequently is it used?
4. Do they share it within the organization?
5. Do they share the data or derivative products outside the organization?
6. Which business needs does parcel data help fulfill?
7. What proportion of your organization's and group's work involves parcel data?

Value of Parcel Data

1. Can you assign a monetary value to their use of parcel data?
2. How confident are you in this value?
3. How did you determine it?
4. Can you indicate the costs of accessing and processing parcel data?
5. How confident are you in the accuracy of these costs?