Labovitz School
OF BUSINESS AND ECONOMICS
Bureau of Business and
Economic Research

Consulting Report

Minnesota Public Libraries' Return on Investment

December 2011

for the

Minnesota Department of Education

INSTITUTE of Museum and Library SERVICES

$4.62	=	Return on Investment
$898,041,512	=	Libraries' Total Value
$260,814,618	=	Economic Impact of Operations Payroll
$366,485,456	=	Economic Impact of Operations Services
3,674	=	Economic Impact of Operations Jobs
$194,498,300	=	State and Local Government Support

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TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

EXECUTIVE SUMMARY

Survey of General Population

Overall, our statewide survey of the general population of Minnesota households indicates that Minnesotans feel that public libraries are a very important part of a community, and that public library funding should remain the same or be increased. If additional resources are needed for public libraries to continue, there are divergent views about user fees, taxes and/or reducing services. The most frequently favored option is to use taxes, not user fees and/or reduced services. However, the next most favored option is to seek user fees and/or reduced services and not taxes. Findings vary by the pattern of respondent and household use of public libraries, and background items. These items include household income, respondent gender, age, and geographic location. Details of the findings are reported in the body of this report. Some highlights from the survey analysis include the following:

- There is a higher level of household usage of public libraries among those in the Twin Cities area (83%) compared to Greater Minnesota (72%).
- There is no statistically significant difference in reported household usage of public libraries by men or women, although gender differences show up in other patterns of usage.
- There is no statistically significant difference between men and women on the question of whether public library support should be increased, remain the same, or be decreased, although in both cases a vast majority felt that public library support should stay the same or increase.
- In all income categories, to increase support, the highest percentage of respondents favor using taxes and oppose user fees or reduced service.
- The overwhelming percentage in all income categories feel that public libraries are very important.
- Those with more education are more likely to report household use of a public library in the past year: 62% among those with some college or less education, 83% among those who have graduated from a technical or other college, and 92% among those with post graduate work.
- There appears to be no statistically significant difference between these education groups in their feeling of the importance of having a public library in every community. All groups feel this is important.
- There is no statistically significant difference among age groups in the importance they express for there being a public library in every community, or on the question about whether public library support should be increased, remain the same or be decreased.
- The highest reported usage of libraries was in the Metropolitan area (83%) and the lowest in the Arrowhead/East Central region (66%). Household usage for other regions is 78% for Southeastern, 75% for Great River, 74% for Plum Creek/Traverse/ Pioneerland, and 69% for Viking/NW/Kitchigami/Lake Agassiz region.

The main conclusion from this survey is that Minnesotans feel public libraries are important and that their support should be maintained or increased.

User Survey: Valuation

The value of bundled library services is estimated using a contingent valuation methodology and a survey of public library users in Minnesota. The results suggest the average household would be willing and able to donate between $31.7 and $38.3 US dollars annually, resulting in a total donation for Minnesota's approximately 2,061,882 households of $65.4 to $79.0 million annually. These estimated amounts should be considered "snapshots," as demand conditions can change frequently.

Economic Impact

BBER also researched capital outlays and operating costs, identified sources of operating funds, and determined direct inputs for an input-output economic model in order to estimate the economic

impact of Minnesota's public libraries on the State of Minnesota.

The economic impact on Minnesota's economy from capital outlays and annual operations of public libraries is summarized as follows:

Economic Impact of Minnesota Public Libraries on the State of Minnesota, in 2010 Dollars

Capital Expenditures Impacts:	*Totals*
Value Added (payroll)	$35,514,913
Output (services)	$65,307,568
Employment (jobs)	528

Operations Impacts:	*Totals*
Value Added (payroll)	$260,814,618
Output (services)	$366,485,456
Employment (jobs)	3,674

Sources: IMPLAN, Bibliostat

Return on Investment

The return on investment (ROI) in Minnesota of public library service in 2010 is calculated as follows: Using contingent valuation, as well as a cost-based approach, the total economic contribution of Minnesota public libraries is estimated to be $898,041,512. The Minnesota population served by public libraries in 2010 is reported by the US Census as 5,303,925. The economic contribution per capita equals $169.32. The local and county tax support per capita equals $36.67. Therefore, the dollar annual return per dollar of public tax support equals $4.62. Comparisons with recent findings from other states show that Minnesotans enjoy a somewhat greater rate of return than the mean ($4.23) for a sample collection of other state's findings.

Social Return on Investment

Monetized impacts and other benefits from annual operations in 2010 delivered a payroll impact of more than $260.8 million dollars, a sales [services] impact of more than $366.4 million dollars, and an employment impact of an estimated 3,674 jobs to the State.

However, the social return on investment (SROI) from Minnesota public libraries is greater than the measureable return on investment. Other benefits of significant value include the collection of materials itself, and the many services of the library; the educational programs, as well as the educational and literacy benefits of the library's mission; technology for use in the library; the expertise of the library staff; the library facility as a community gathering place; the "halo" spending by library users at establishments close to the library; and the value of a library's enhancement to neighborhood real estate and community partnerships.

Although the need for public funding and competition from the Internet can be negative aspects for libraries, stakeholders enjoy many other positive aspects. Inside and outside the library system, library users with children or grandchildren benefit, as do employees from the community at large who check out materials for use at their workplace, library users who contact public library reference libraries for information, and technology users with a need for Internet access.

Costs and Benefits

Benefits include assessments listed in our chapters on return on investment, user valuation, as well as economic impacts. In our chapter on the social return on investment, the quantitative and qualitative value of public libraries in Minnesota is reviewed.

The direct cost to support Minnesota's library system is estimated through analyses of total expenditures and the value of the libraries as an asset to the state. Although public libraries must depend on public funding, a wide diversity of stakeholders show continued willingness to pay the cost of supporting their libraries.

I. SURVEY OF GENERAL POPULATION: PUBLIC SUPPORT FOR MINNESOTA LIBRARIES

Overall, our statewide survey of the general population of Minnesota households indicates that Minnesotans feel that public libraries are a very important part of a community and that public library funding should remain the same or be increased.

If additional resources are needed for a public library to continue, there are divergent views about using user fees, taxes and/or reducing services. The most frequently favored option is to use taxes, not user fees and/or reduced services. However, the next most favored option is to seek user fees and/or reduced services and not taxes.

Findings vary by the pattern of respondent and household use of public libraries. Background items included in the statewide survey are reported here, including household income, respondent gender, age, and geographic location.

The main conclusion from this survey is that Minnesotans feel public libraries are important and that library support should be maintained or increased.

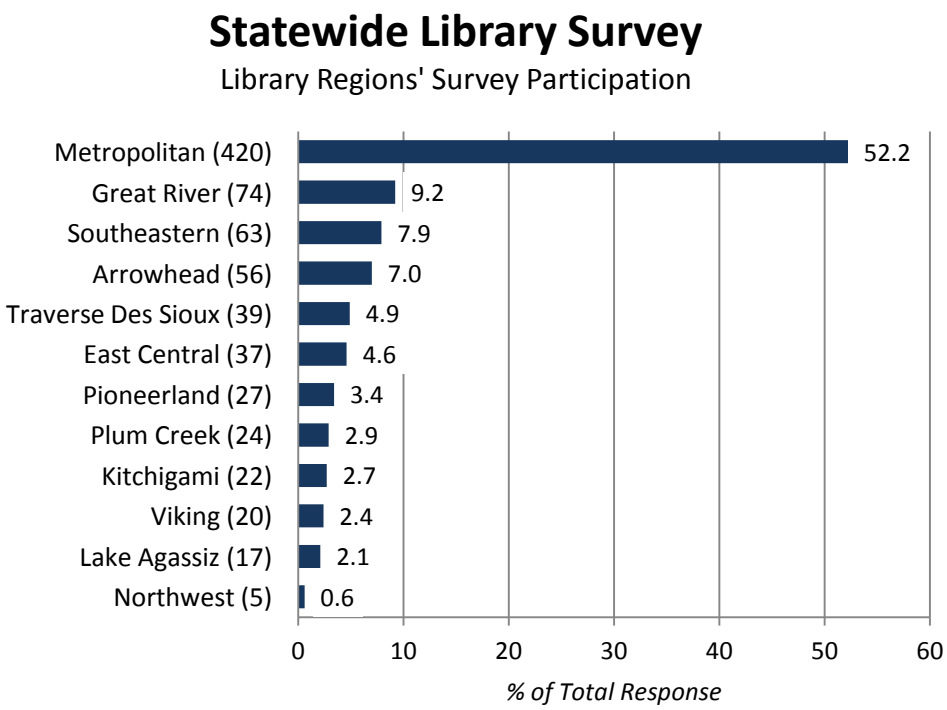
Note: Appendix material to this section includes tables of detailed data findings, and the questionnaire used to gather data for this analysis.

INTRODUCTION

As part of the larger study about Minnesota public libraries conducted by the Bureau of Business and Economic Research at the Labovitz School of Business and Economics at the University of Minnesota Duluth, a telephone survey was conducted in October and November of 2010, using a sample of Minnesota households, randomly chosen from all telephone exchanges. Questions about public libraries in Minnesota were included in the Omnibus State Survey conducted annually by Minnesota Center for Survey Research (MCSR) at the University of Minnesota. The survey methodology is described in an appendix to this report. The study was able to include five questions in the Omnibus Survey. Eight hundred four interviews were completed and, because a random adult was selected from sampled households, results can be generalized to Minnesota adults.

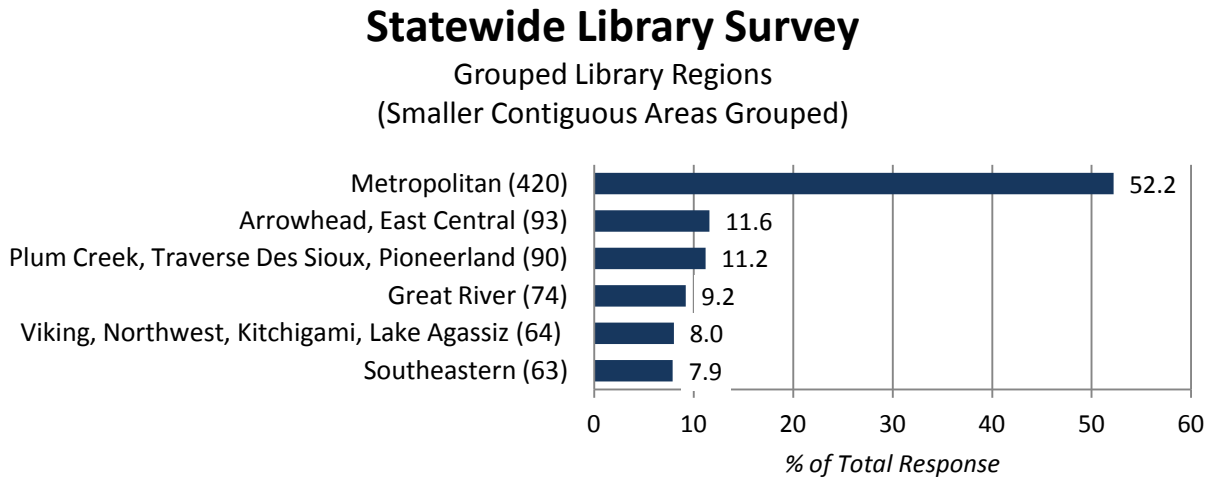
The regional participation in the statewide sample is as follows:

FIGURE 1. STATEWIDE LIBRARY SURVEY, LIBRARY REGIONS' SURVEY PARTICIPATION



For purposes of analysis, and to group library regions in meaningful sub-samples, smaller contiguous areas were grouped as follows:

FIGURE 2. STATEWIDE LIBRARY SURVEY, LIBRARY REGIONS (WITH SMALLER CONTIGUOUS AREAS GROUPED)

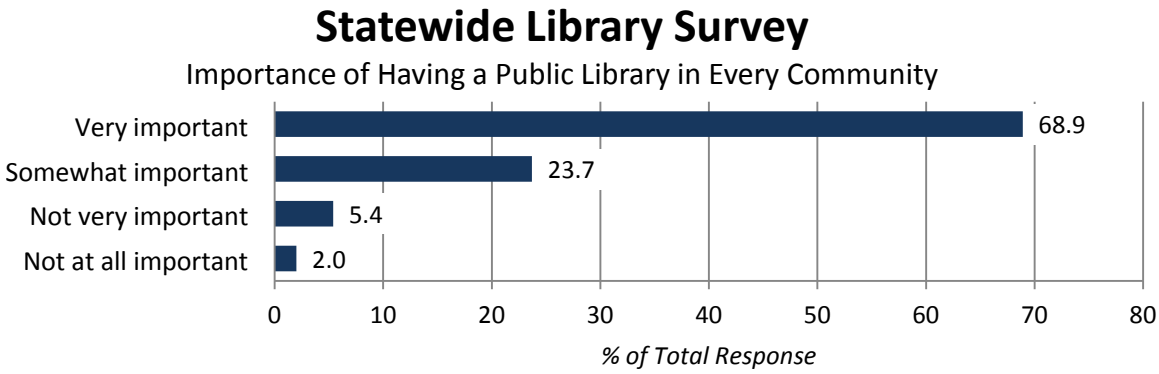


OVERALL SUPPORT AND USE OF PUBLIC LIBRARIES

Public library usage by households is very high. Seventy-eight percent of respondents reported that they or someone in their household used a public library in person or online in the year prior to the October/November survey (2010). Some 23% of respondents reported high usage (6 times or more) for themselves and others in their household. (This, and other combinations of household usage are shown in Table 1 in Appendix B.)

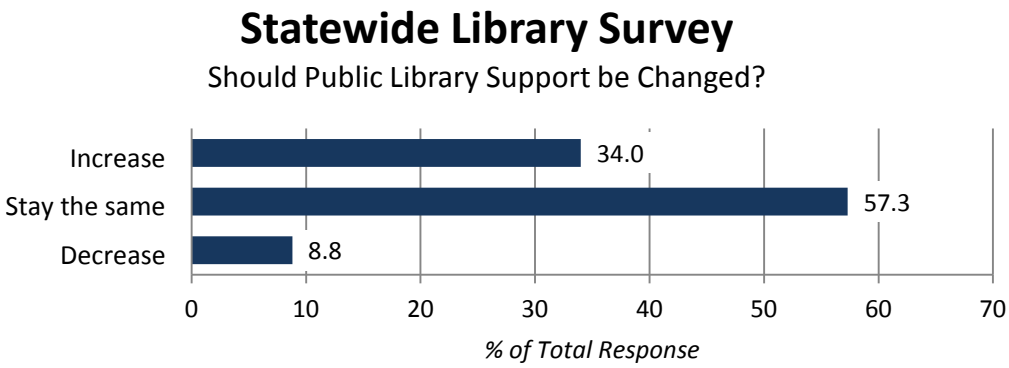
The importance of public libraries to Minnesota adults is very high. Sixty-nine percent of respondents felt it was “very important” to have a public library in every community and almost 93% felt it was “somewhat important" or "very important” (see Table 1 in Appendix B). Only 7% felt that having a public library in every community was "not very" or" not at all important."

FIGURE 3. STATEWIDE LIBRARY SURVEY, IMPORTANCE OF HAVING A PUBLIC LIBRARY IN EVERY COMMUNITY



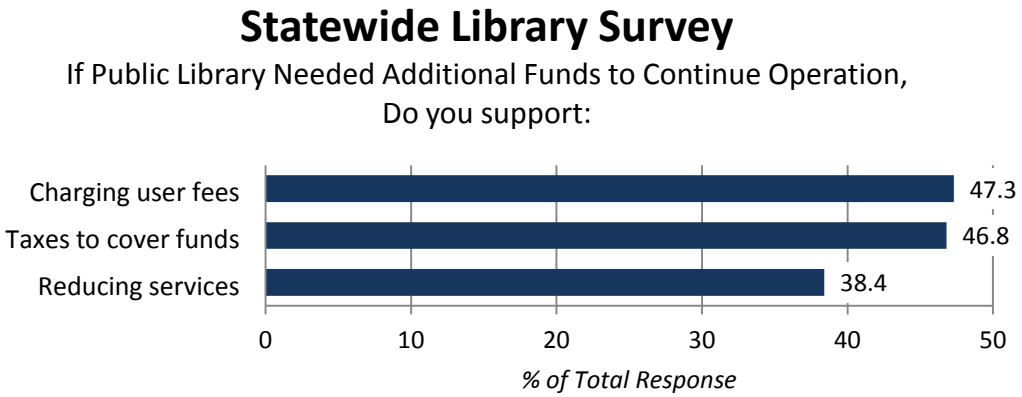
While 57% of all respondents felt library support should stay the same as it is, 34% felt it should be increased, and only 9% felt it should be decreased.

FIGURE 4. STATEWIDE LIBRARY SURVEY, SHOULD PUBLIC LIBRARY SUPPORT BE CHANGED?



A series of questions was asked about support options, should their public library need added funds to continue. Less than half supported user fees (47%), increasing taxes (47%), or decreasing services (38%).

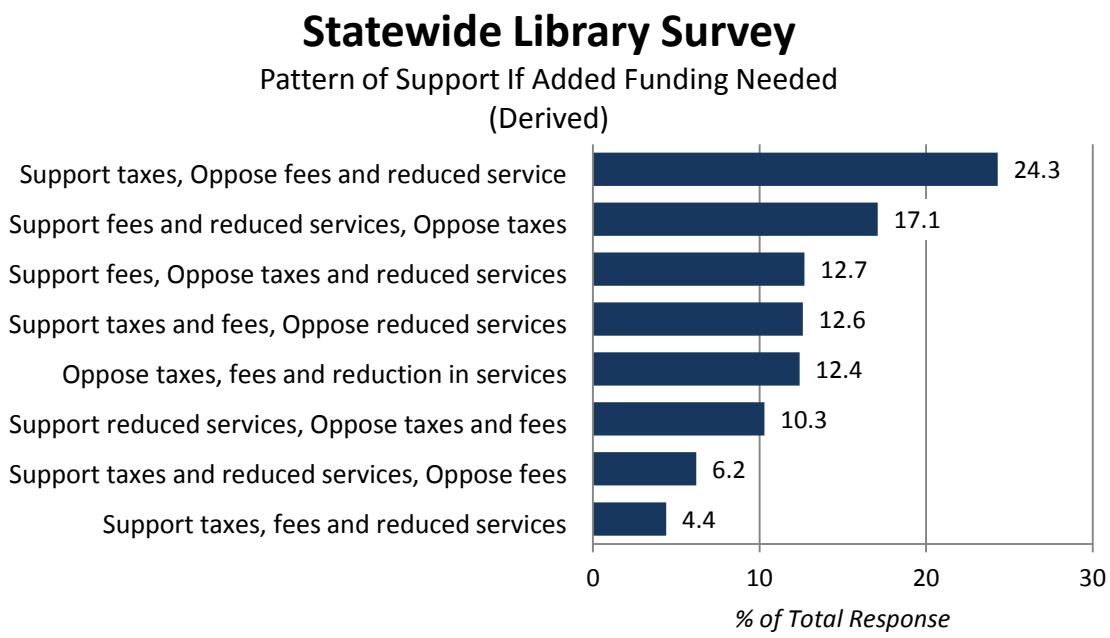
FIGURE 5. STATEWIDE LIBRARY SURVEY, IF PUBLIC LIBRARY NEEDED ADDITIONAL FUNDS TO CONTINUE OPERATION, DO YOU SUPPORT:



The report traces support for patterns of these three options as well.

- **About this chapter's "derived" analyses:**
  Note that the following figure and subsequent discussions and figures refer to statistically derived percentages. In order to quantify respondents' support for libraries configured as positions compounded of the three options surveyed, a further analysis of these patterns was derived by combining, and statistically analyzing possible funding positions. This chapter identifies these derived analytical insights using the term "Further Analysis (Derived)." For readers interested in following the derivation of these analyses, please see the tables of survey data findings presented in Appendix B of this report.

FIGURE 6. STATEWIDE LIBRARY SURVEY, PATTERN OF SUPPORT IF ADDED FUNDING NEEDED



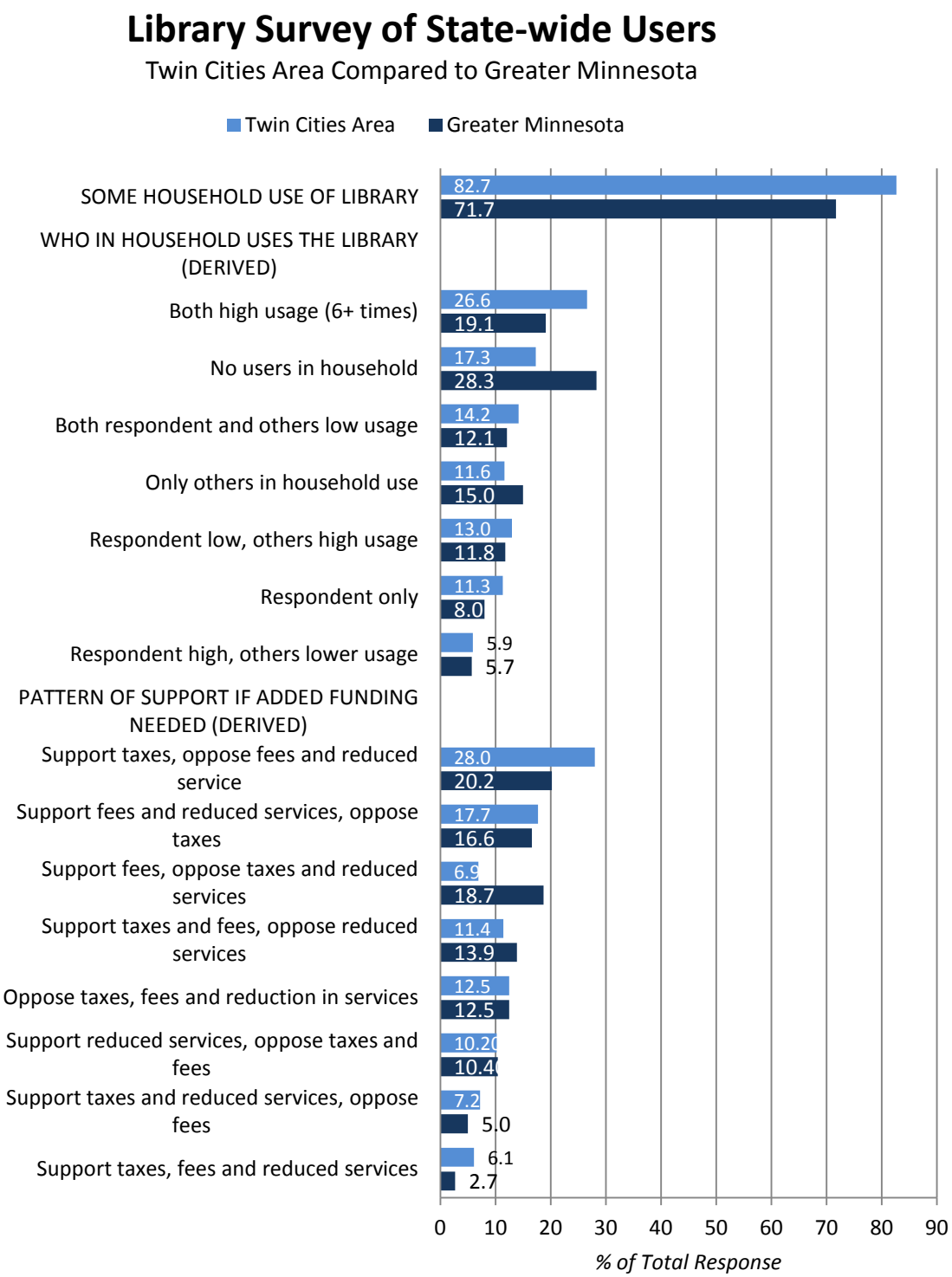
TWIN CITIES AREA COMPARED TO GREATER MINNESOTA

There is a higher level of household usage of public libraries among those in the Twin Cities area (83%) compared to Greater Minnesota (72%). Differences in these tables are considered statistically rare, overall, if the chi square test of significance that was used is statistically significant at the .05 level of significance. Twenty-seven percent of Twin Cities area respondents, versus 19% of Greater Minnesota respondents, reported that both they and others in the household were high users of public libraries (defined as 6 times or more in 2010, prior to the survey).

The level of household usage and support of public libraries among those in the Twin Cities area was compared to Greater Minnesota:

- **There is a higher level of household usage of public libraries among those in the Twin Cities area (83%) compared to Greater Minnesota (72%).**

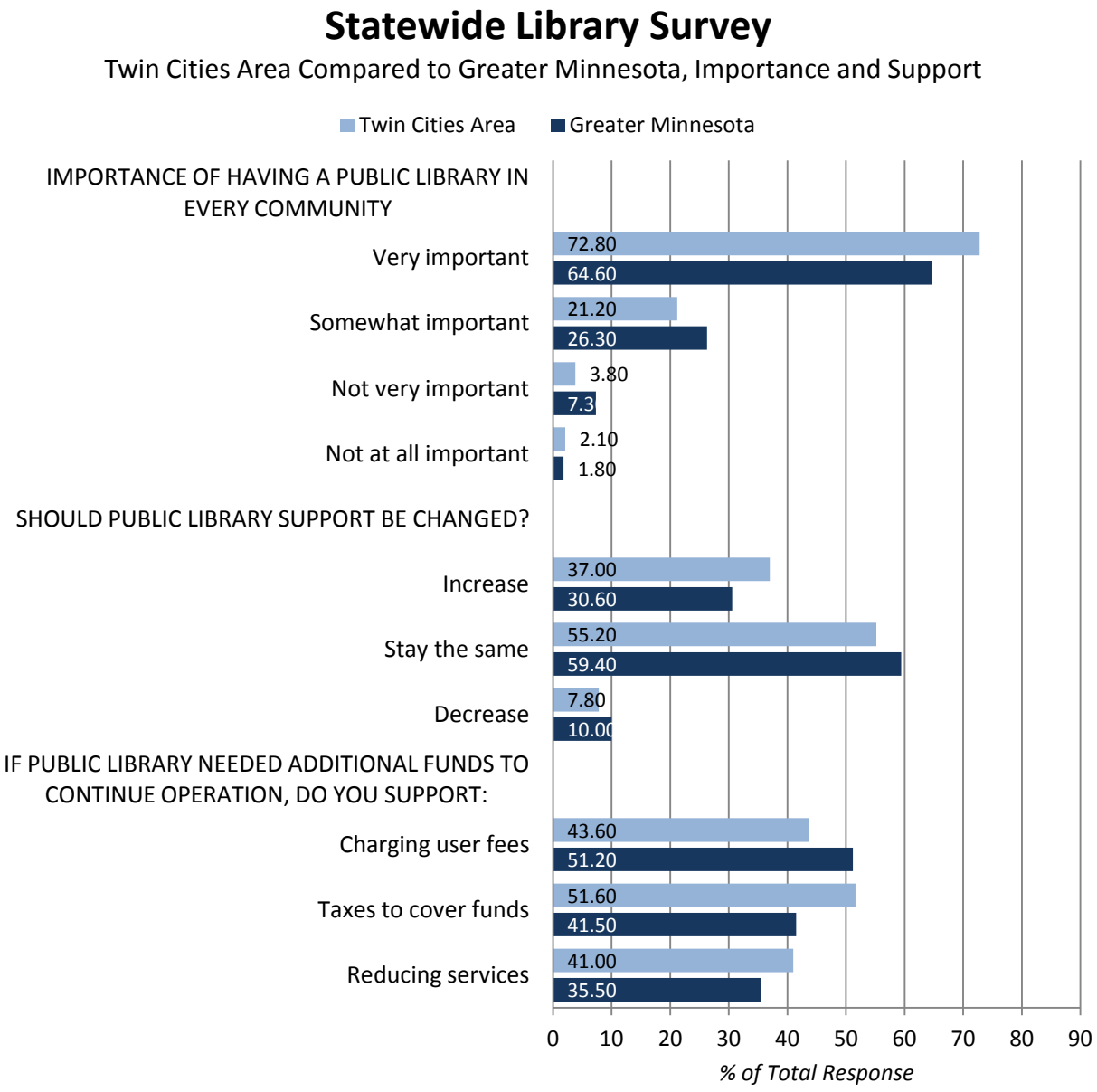
FIGURE 7. STATEWIDE LIBRARY SURVEY: TWIN CITIES AREA COMPARED TO GREATER MINNESOTA, USE AND SUPPORT



While ninety-four percent of Twin Cities respondents felt it was somewhat or very important to have a public library in every community, compared to 91% of respondents in Greater Minnesota, among Twin Cities respondents, 73% felt it was very important, compared to 65% in Greater Minnesota.

Twin Cities area and Greater Minnesota respondents did not differ significantly in their view of whether public library support should be increased, remain the same, or be decreased. In both cases, over 90% felt funding should remain the same or be increased.

FIGURE 8. STATEWIDE LIBRARY SURVEY: TWIN CITIES AREA COMPARED TO GREATER MINNESOTA, IMPORTANCE, SUPPORT



Further Analysis (Derived). Respondents were asked about their support for three options, should public libraries need additional funding to continue operation. While there was a statistically significant difference in support for charging user fees (51% for Greater Minnesota and 44% for Twin Cities respondents), and for using taxes (42% for Greater Minnesota and 52% for Twin Cities respondents), there was no statistically significant difference in support for reducing services. Tables in Appendix B show various patterns of support for these three options for added funding. There is a statistically significant difference between Greater Minnesota respondents and those in the Twin Cities on these patterns. For example, 28% of Twin Cities respondents support using taxes but oppose charging user fees or reducing services, compared to 20% who support this pattern among respondents in Greater Minnesota. Greater Minnesota respondents are more likely than Twin Cities respondents to support fees but oppose using taxes or reducing services (19% vs. 7%).

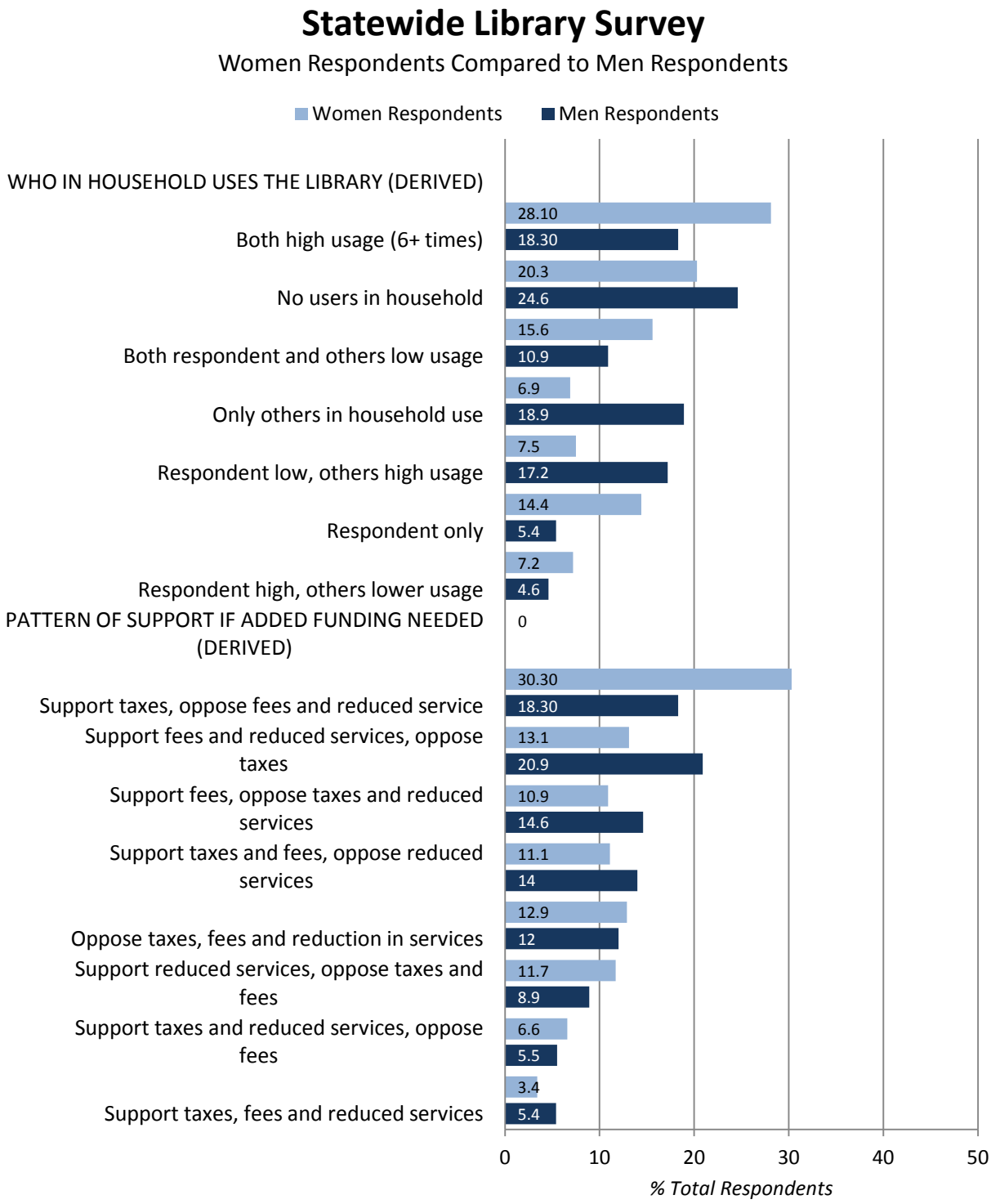
GENDER

There is no statistically significant difference in reported household usage of public libraries by men or women, although gender differences show up in patterns of usage. For example, 28% of women and 18% of men report high usage by themselves and by others in their household. There are somewhat more men who report that they and their household have no public library users (25%), compared to 20% among women respondents. Nineteen percent of men and 7% of women report that only others in their household used the public library in 2010, prior to the survey.

Further Analysis (Derived). There is a statistically significant difference in the pattern of support for these three options: 30% of women but only 18% of men support taxes and oppose fees and reduced service. Twenty-one percent of men and only 13% of women support fees and reduced services but oppose taxes. Fifteen percent of men support fees but oppose taxes and reduced services, compared to 11% among women respondents.

- **There is no statistically significant difference in reported household usage of public libraries by men or women, although gender differences show up in patterns of usage.**
- **There is no statistically significant difference between men and women on the question of whether public library support should be increased, remain the same, or be decreased, although in both cases the vast majority felt that public library support should stay the same or increase**.

FIGURE 9. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY GENDER: USE AND SUPPORT

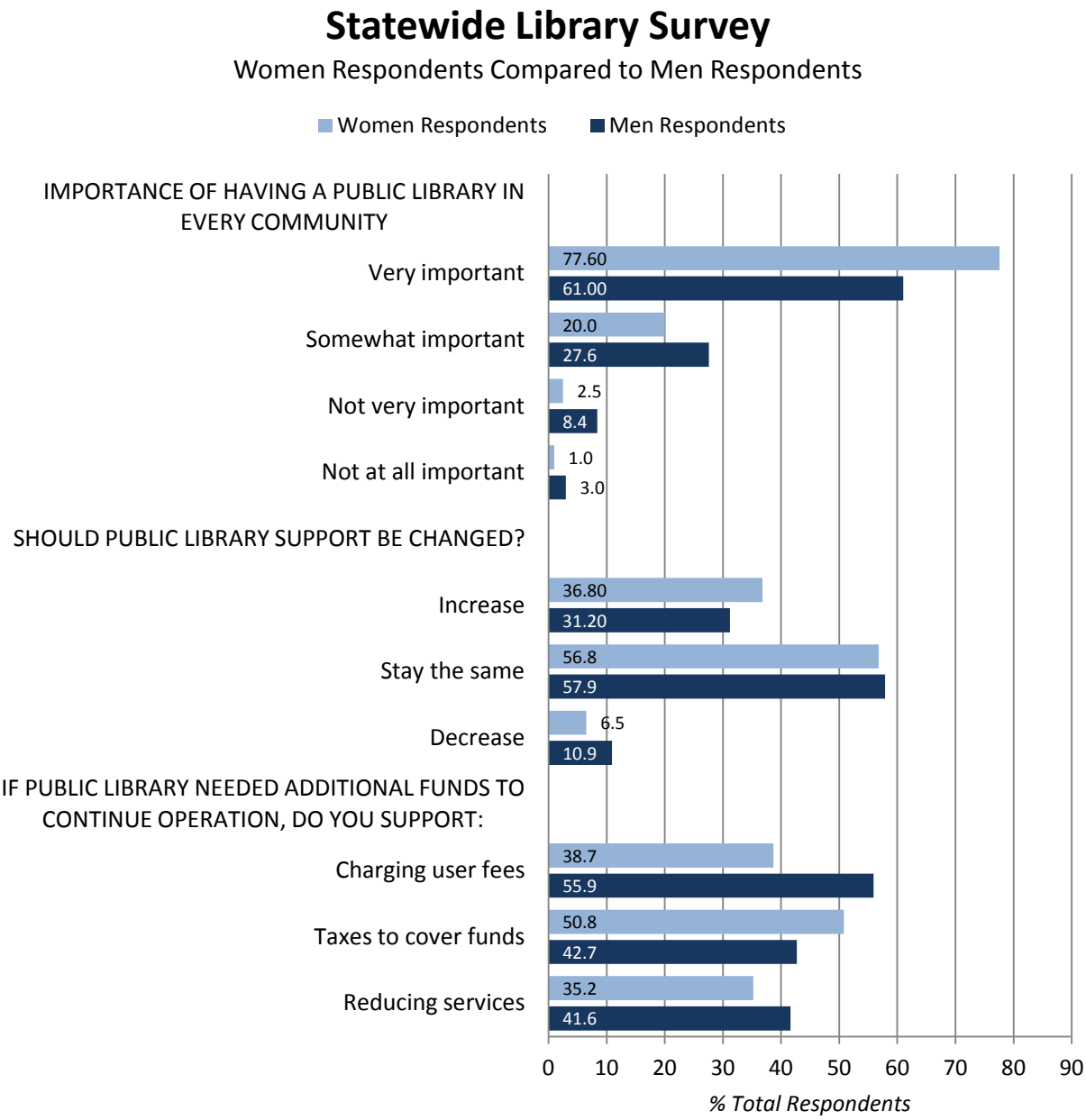


Over three quarters of women (77%) say that it is very important to have a public library in every community, compared to 61% of men. Overall, however, both men and women felt that having a public library in every community was somewhat or very important (97% of women and 89% of men).

There is no statistically significant difference between men and women on the question of whether public library support should be increased, remain the same, or be decreased, although in both cases the vast majority felt that public library support should stay the same or increase.

On the options for funding—should public libraries need additional support to continue operation—men and women differed on overall support for charging user fees (56% for men and 39% for women), and using taxes (43% for men and 51% for women), but did not differ significantly on reducing services.

FIGURE 10. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY GENDER: IMPORTANCE AND SUPPORT



ANNUAL HOUSEHOLD INCOME

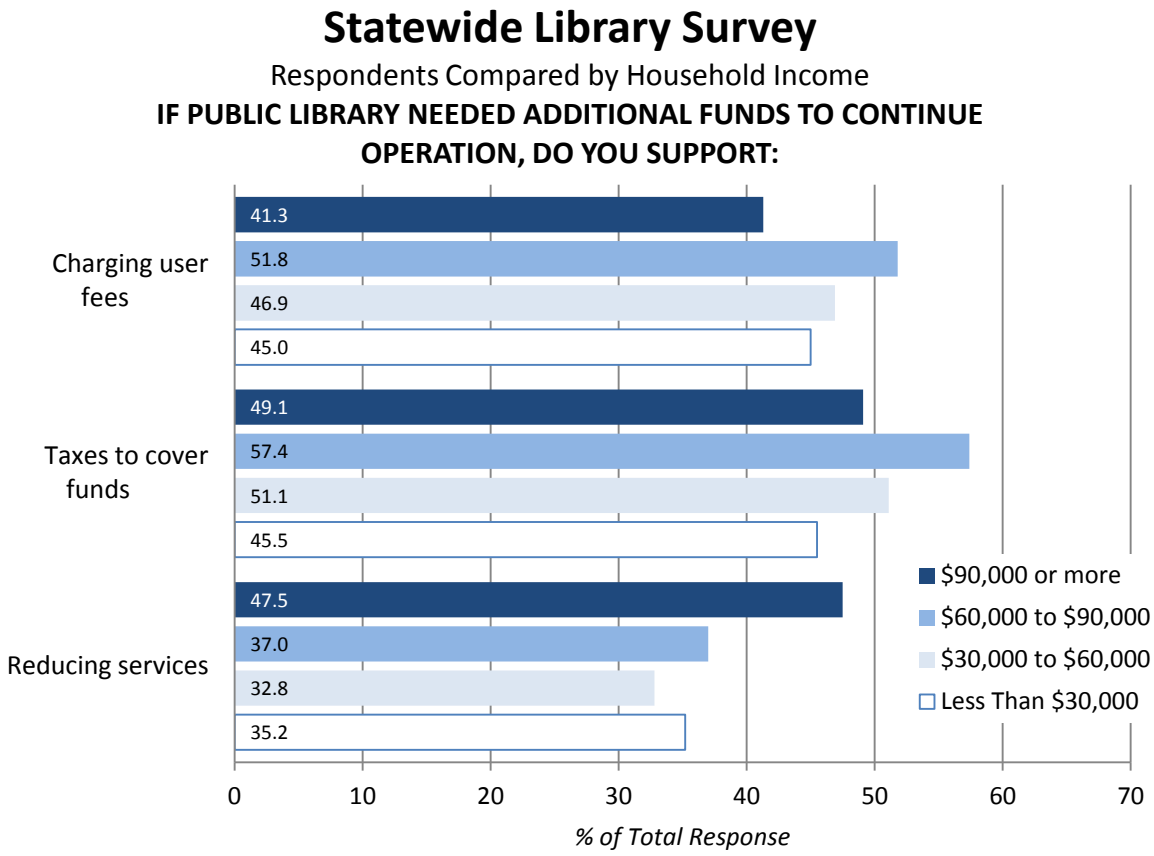
Annual household income was divided into four categories: less than $30,000, $30,000 to $60,000, $60,000 to $90,000, and $90,000 or more. There was a significant difference in reported household library usage by income.

Further Analysis (Derived). Fifty-four percent of those with the lowest household income reported some public library use, while all incomes above $30,000 reported above 83% household use of public libraries the year prior to their interview. Among households in the lowest income category, 13% report that only the respondent used a public library, compared to 8% in $30–$60,000 households, 7% in $60–$90,000 households and 11% in the highest income category. There is a higher use in all other combinations of users for households with $30,000 or higher annual incomes.

Overall comparison of respondent views by household income in this sample shows no statistically significant difference in supporting user fees or taxes but there is a statistically significant difference among income groups in view of reducing services. Among the highest income group, 48% support reducing services if additional funds are needed to continue operation of the public library. Only about a third of respondents from lower income households support reducing services (35%, 33%, 37%).

- **Analysis of survey data shows that if public libraries needed additional funds to continue operation, in all income categories, the highest percentage of respondents favor using taxes and oppose user fees or reduced service.**
- **The overwhelming percentage in all income categories feel that public libraries are very important.**

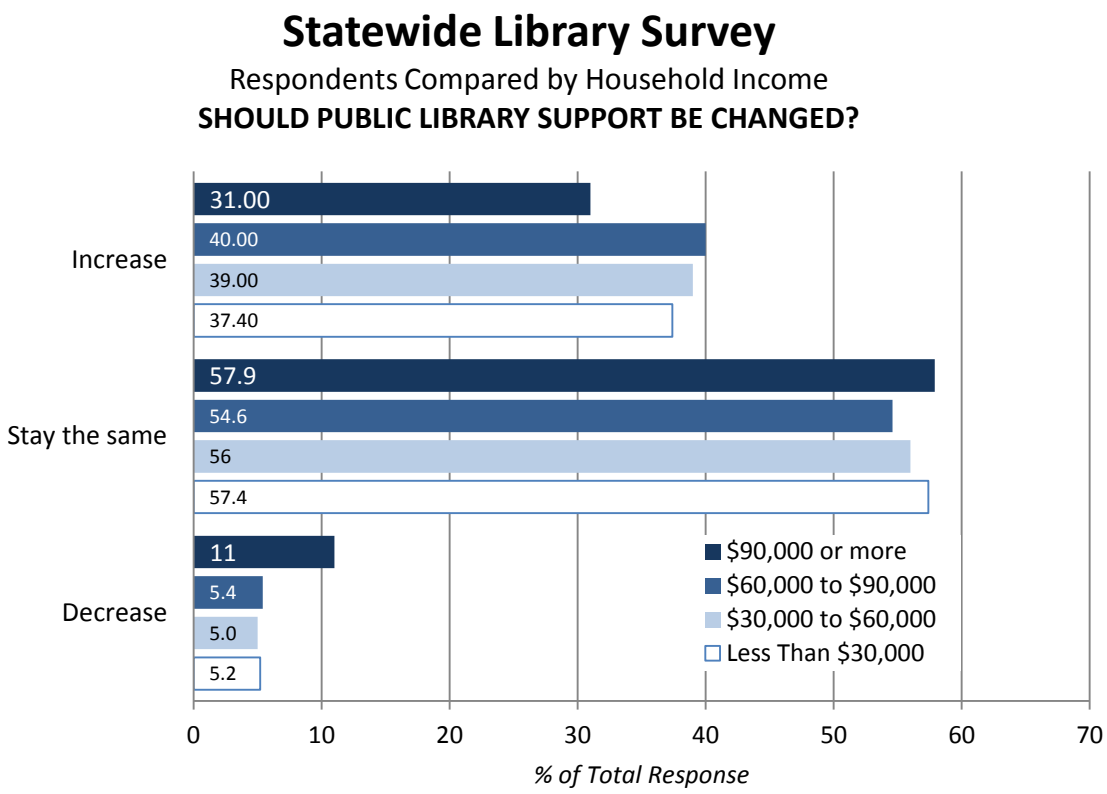
FIGURE 11. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY INCOME: IF PUBLIC LIBRARY NEEDED ADDITIONAL FUNDS TO CONTINUE OPERATION, DO YOU SUPPORT



Further Analysis (Derived). Further analysis shows there are statistically significant differences in the pattern of support given to the three options for public libraries seeking added funding if it should be needed: user fees, taxes, and reduced service**.** In all income categories, the highest percentage of respondents favor using taxes and oppose user fees or reduced service. (See Appendix B for tables displaying percentages from which the following statistical results are derived.) However, 24% of households with $90,000 or higher annual incomes oppose using taxes for added funding and support user fees and/or service cuts. This compares to a much lower endorsement of this option among other income groups (12%, 15% and 14%). The $60-$90,000 respondents are more likely than other income groups to oppose fees but support taxes and reduced service (2% for the lowest income group, 6% for $30-$60,000 households, and 8% for the highest income group).

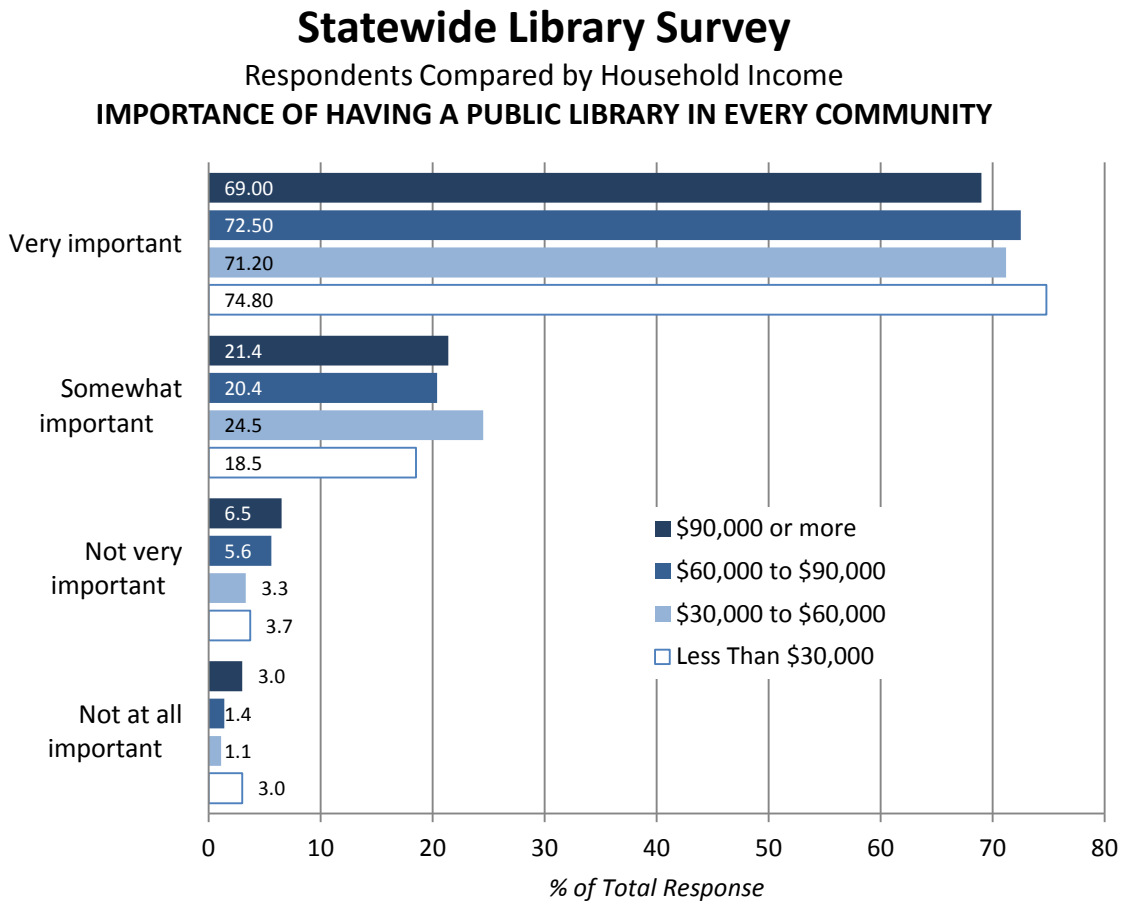
There is also no statistically significant difference across income categories in support for increasing public library support, keeping it the same or decreasing it. Again the majority favor keeping support the same as it is with 30-40% favoring an increase and a small minority favoring a decrease.

FIGURE 12. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY INCOME: SHOULD PUBLIC LIBRARY SUPPORT BE CHANGED?



As the next table shows, respondents from households with different annual incomes do not differ significantly in their view of the importance of having a public library in every community. The overwhelming percentage in all income categories feel that public libraries are very important.

FIGURE 13. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY INCOME: IMPORTANCE OF HAVING A PUBLIC LIBRARY IN EVERY COMMUNITY



HOUSEHOLD USE OR NON-USE OF PUBLIC LIBRARIES

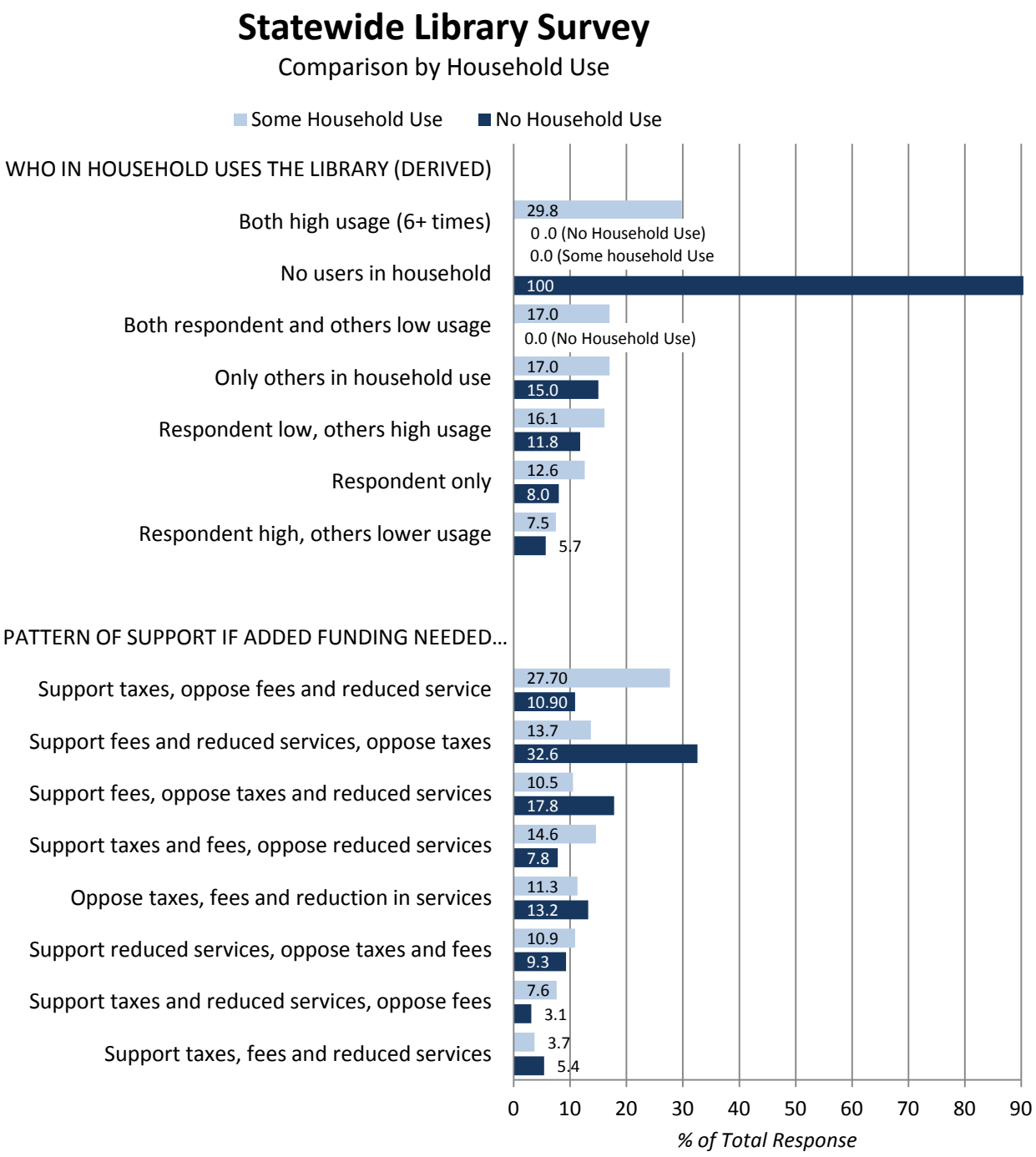
As noted earlier, this study indicates that 78% of Minnesota households have used a public library at some point during 2010, prior to their October-November interview.

Further Analysis (Derived). Among those who use the library, 30% indicate that both the respondent and others in their household are "high" users of the library (defined as 6 times or more); 13% report that the respondent is the sole user; while 17% report that only others in the household were users.

Further Analysis (Derived). There is a statistically significant difference between using and non-using households in the pattern of support they give to using taxes, reduced service or user fees as a way to provide public libraries with added funding should it be needed. Users are more likely than non-users to support taxes and oppose fees and reduced service (28% to 11% for non users). Non-users are more likely to support fees and reduced services and oppose using taxes (33% of non-users and 14% among

library users). Users support taxes and/or fees rather than reducing services (15% to 8% among non-users).

FIGURE 14. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY HOUSEHOLD: USE AND SUPPORT

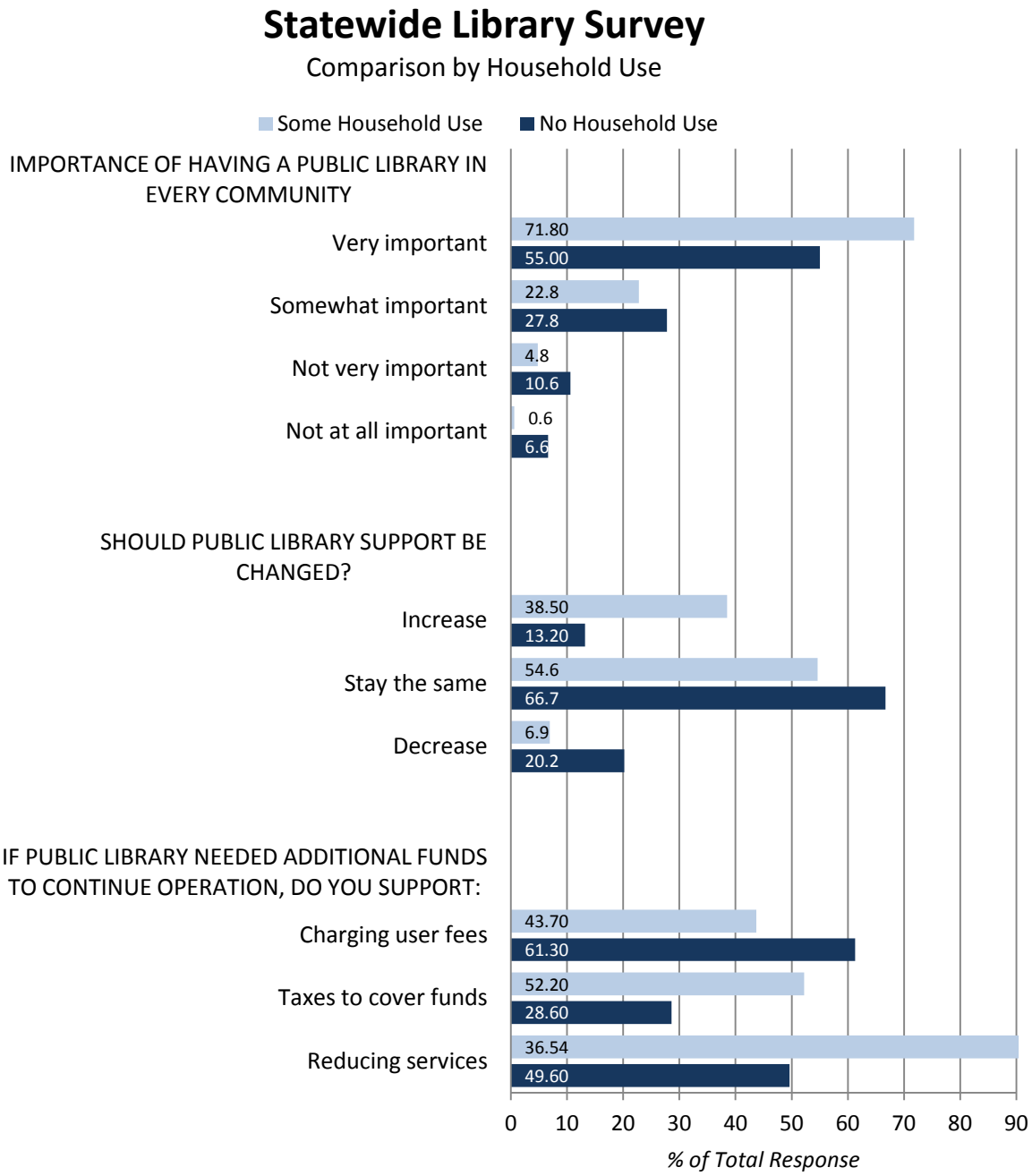


Households with library users are more likely to feel that having a public library in every community is very important (72% vs. 55% for non-users). Ninety-five percent of users and 83% of non-users feel having a library in every community is either somewhat or very important. Seventeen percent of non-users and 5% of users felt that having a public library in every community was not important.

Overall 80% of non-users and 93% of users felt that public library support should remain the same or be increased. Sixty-seven percent of non-users and 55% of users felt that public library support should stay the same. Thirteen percent of non-users and 38% of users felt that support should be increased and 20% of non-users felt support should be decreased compared to 7% of users.

Overall support for using taxes, user fees, or reduced services as a means for getting added funding should that be needed, shows statistically significant differences between users and non users in using library user fees (61% non-users vs. 44% users), taxes (29% non-users vs. 44% users) and reducing services (50% non users vs. 36% users).

FIGURE 15. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY HOUSEHOLD: IMPORTANCE AND SUPPORT

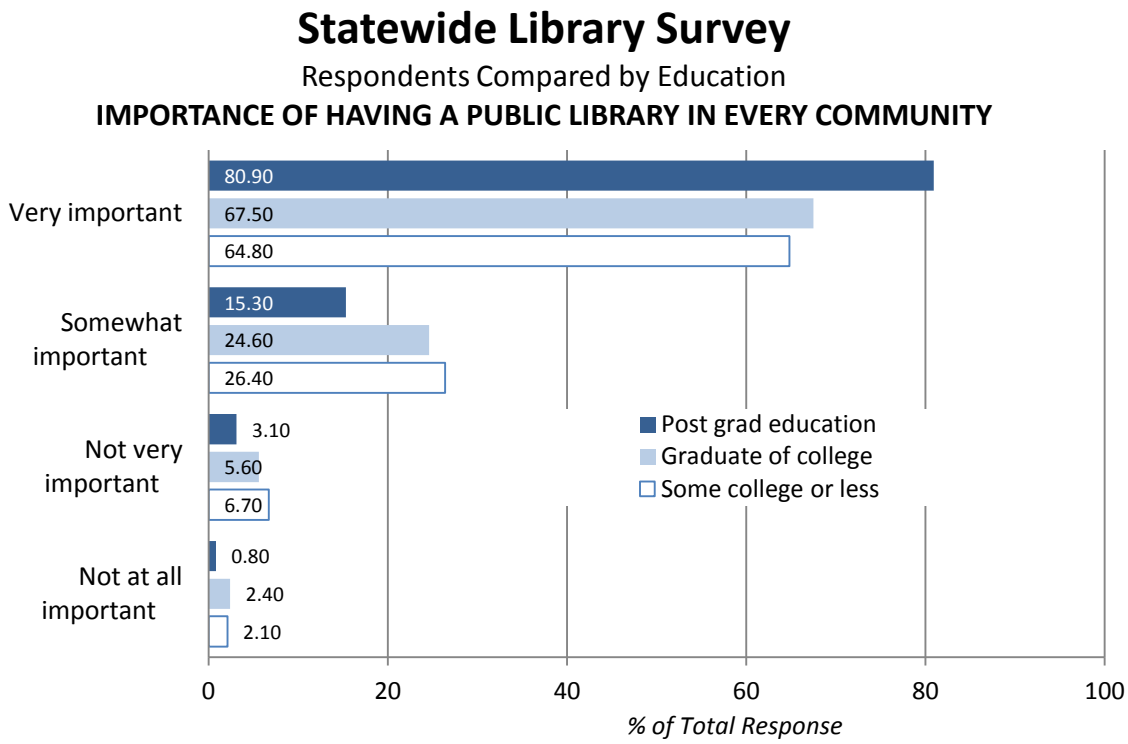


EDUCATION OF RESPONDENT

Three education groups were defined as those with post graduate education, graduates of college, and those with some college or less. Those with more education are more likely to report household use of a public library in the past year: 62% among those with some college or less education, 83% among those who have graduated from a technical or other college, and 92% among those with post graduate work.

There appears to be no statistically significant difference between these education groups in their feeling of the importance of having a public library in every community. All groups feel this is important.

FIGURE 16. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY EDUCATION: IMPORTANCE OF HAVING A PUBLIC LIBRARY IN EVERY COMMUNITY

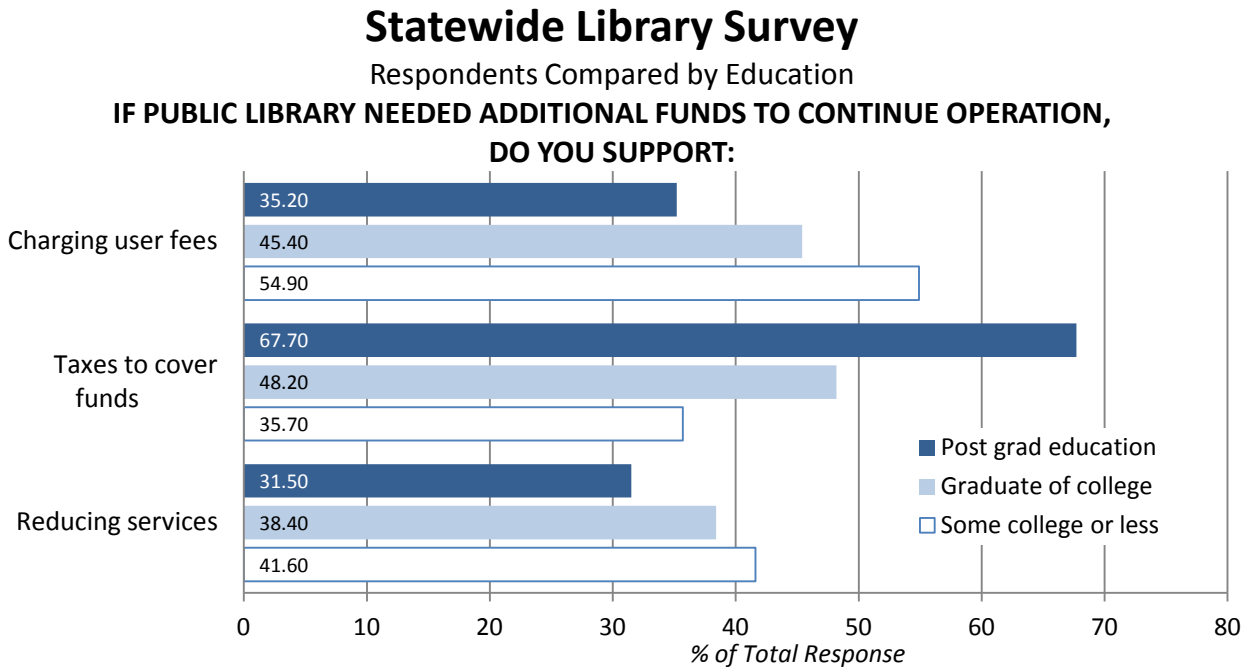


Overall, when asked about their support separately for each of the three funding options—user fees, taxes or reducing services—the three education groups did not differ significantly in their support for reducing services but were significantly different on the other two options. User fees were supported by 55% of those with some college or less education, 45% among those who graduated from some college, and 35% among those with post graduate education. The reverse pattern is evident in support for using

taxes for added funding with 36% of those with less education and 68% among those with most education supporting this option (48% supported this option among the middle education group).

- **Those with more education are more likely to report household use of a public library in the past year: 62% among those with some college or less education, 83% among those who have graduated from a technical or other college, and 92% among those with post graduate work.**
- **There appears to be no statistically significant difference between these education groups in their feeling of the importance of having a public library in every community. All groups feel this is important.**

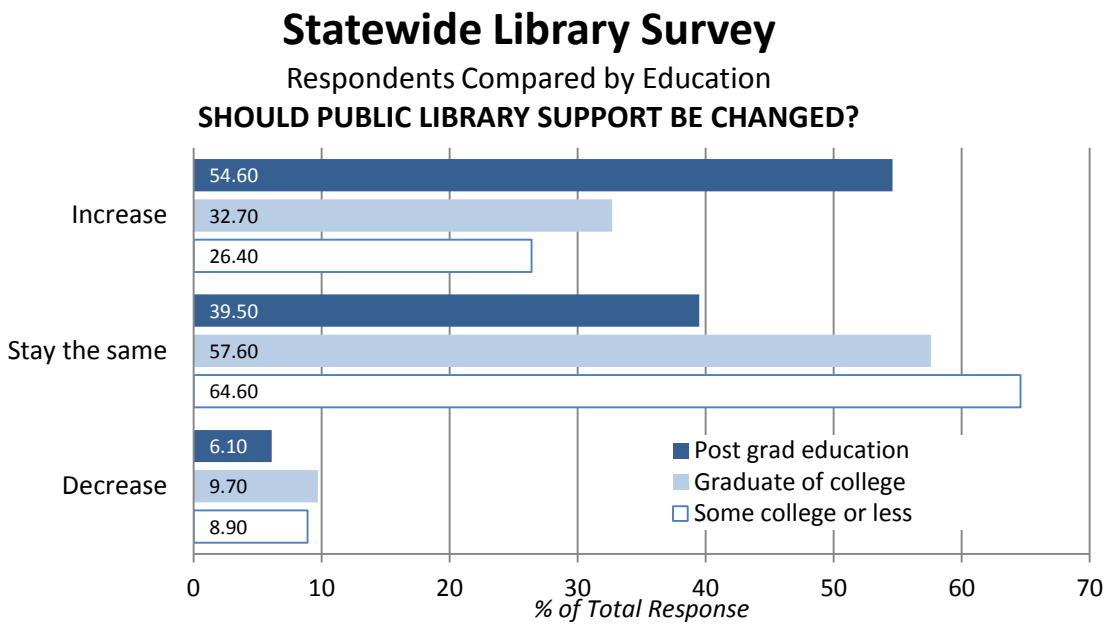
FIGURE 17. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY INCOME: IF PUBLIC LIBRARY NEEDED ADDITIONAL FUNDS TO CONTINUE OPERATION, DO YOU SUPPORT



Also, there is a statistically significant difference between the three education groupings in their view of whether public library support should be increased (26% among the lower educated group, 33% and 54% among the higher educated group). Sixty-five percent of those with some college or less education

felt that library support should stay the same (58% for the middle group and 40% for the higher group). The lower two groups were more likely than the higher education group to support decreased public library support (9% and 10%) compared to 6% among the higher group).

FIGURE 18. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY EDUCATION: SHOULD PUBLIC LIBRARY SUPPORT BE CHANGED?



Further Analysis (Derived). Educational differences are also shown in the pattern of who in the respondent's household used a public library. For example, households where both the respondent and others in their household have high usage of public libraries (defined as 6 times or more in the past year), usage varies by respondent's level of education. Where respondents have some post graduate work 35% of households have high public library usage, compared to 12% among respondents with some college or less educational background. Nineteen percent of respondents with some college or less, report that only others in the household, not the respondent, used the public library. Among those with more education this pattern of library use is less often seen (11% among graduates and 8% among those with post graduate work).

Further Analysis (Derived). Among respondents with less education, 19% support using fees or reduced services and oppose taxes if added funding is needed and 18% support fees but oppose taxes or reduced services. This pattern of response to the three added funding options is quite different from responses of those who have graduated from college or who have post graduate education, where supporting taxes and opposing user fees or reduced service is the option most supported (26% and 40%). For those who graduated from some college, the second most frequent choice (18%) was supporting user fees and reduced services but opposing taxes. Among those with some post graduate education, the next most

frequent option (13%) was supporting taxes and fees and opposing reduced service. The most highly educated Minnesotans appear to favor taxes as an option for needed funding.

AGE (COHORT) OF RESPONDENT

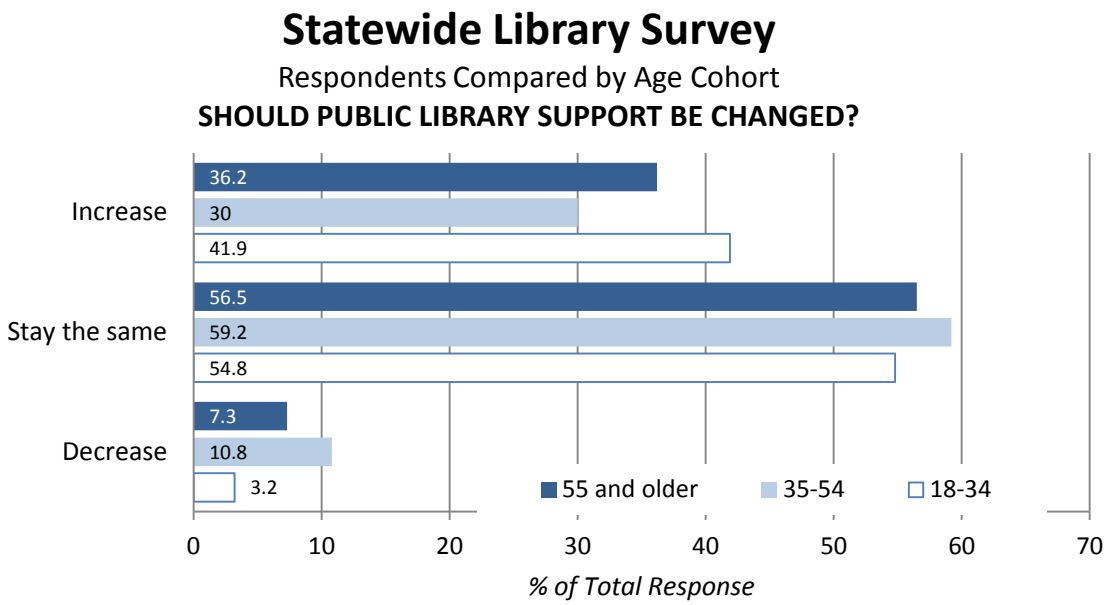
Reported household usage of the public library varies by the respondent's age group. Eighty-eight percent of 18–34 year olds (born 1976 to 1992) reported that they and/or someone in their household used a public library in 2010, prior to their interview. Among those 35–54 (born 1956 to 1975) 84% of households report public library usage. A lower percentage of households (70%) used the public library among those aged 55 or older (born before 1956).

Further Analysis (Derived). There is a statistically significant difference among age groups in the pattern of usage. Twenty-one percent of the younger group report high usage by both respondent and others in their household (defined as 6 or more times in the past year). Twenty-nine percent of the middle group and 19% of the oldest group report similar high usage by both respondent and others. Among the youngest group, 27% report that both respondent and others in the household made low usage of the public library, compared to 11% of the middle group and 12% of the older group. Twelve percent of the older group report that only the respondent used the library, compared to 4% and 6% for the other age groups. Twelve percent of the youngest group report high use by respondents but low use by others in the household, compared to 5% for both of the other age groups.

There is no statistically significant difference among these age groups in the importance they express for there being a public library in every community, or on the question about whether public library support should be increased, remain the same or be decreased.

- **There is no statistically significant difference among these age groups in the importance they express for there being a public library in every community or on the question about whether public library support should be increased, remain the same or be decreased.**

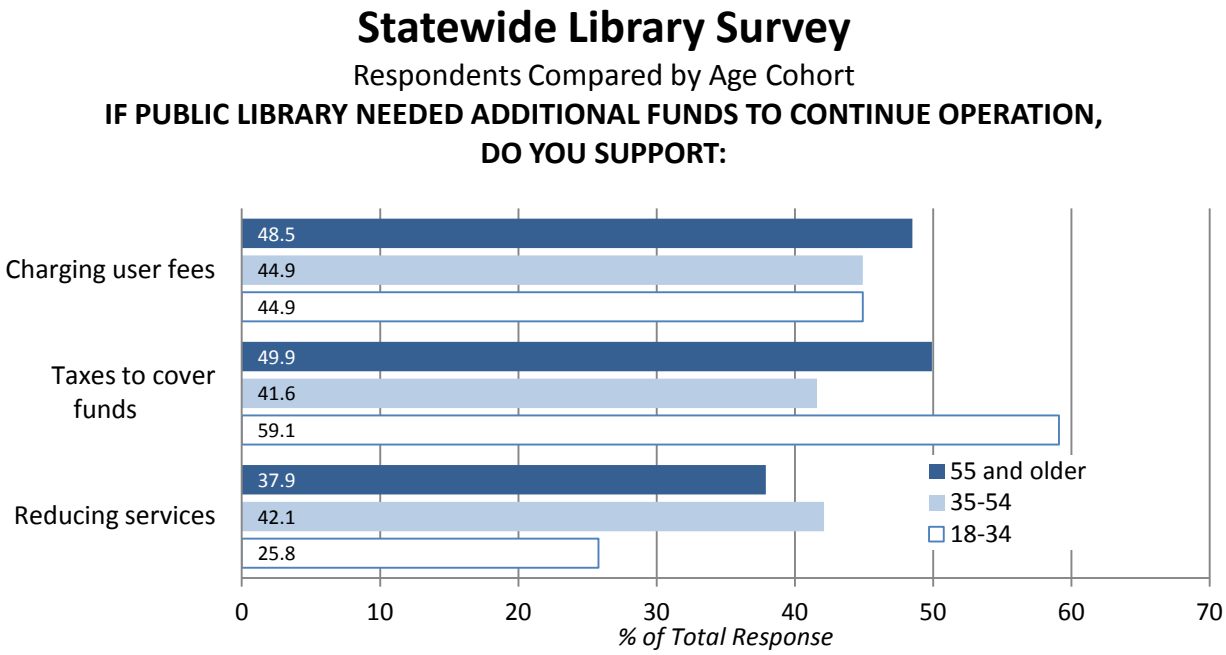
FIGURE 19. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY AGE COHORT: SHOULD PUBLIC LIBRARY SUPPORT BE CHANGED?



While there appears to be no statistically significant difference between these age groups and the pattern of support for three options for providing added funding should it be needed, there is an overall statistically significant age difference in support for taxes and for reducing services as options.

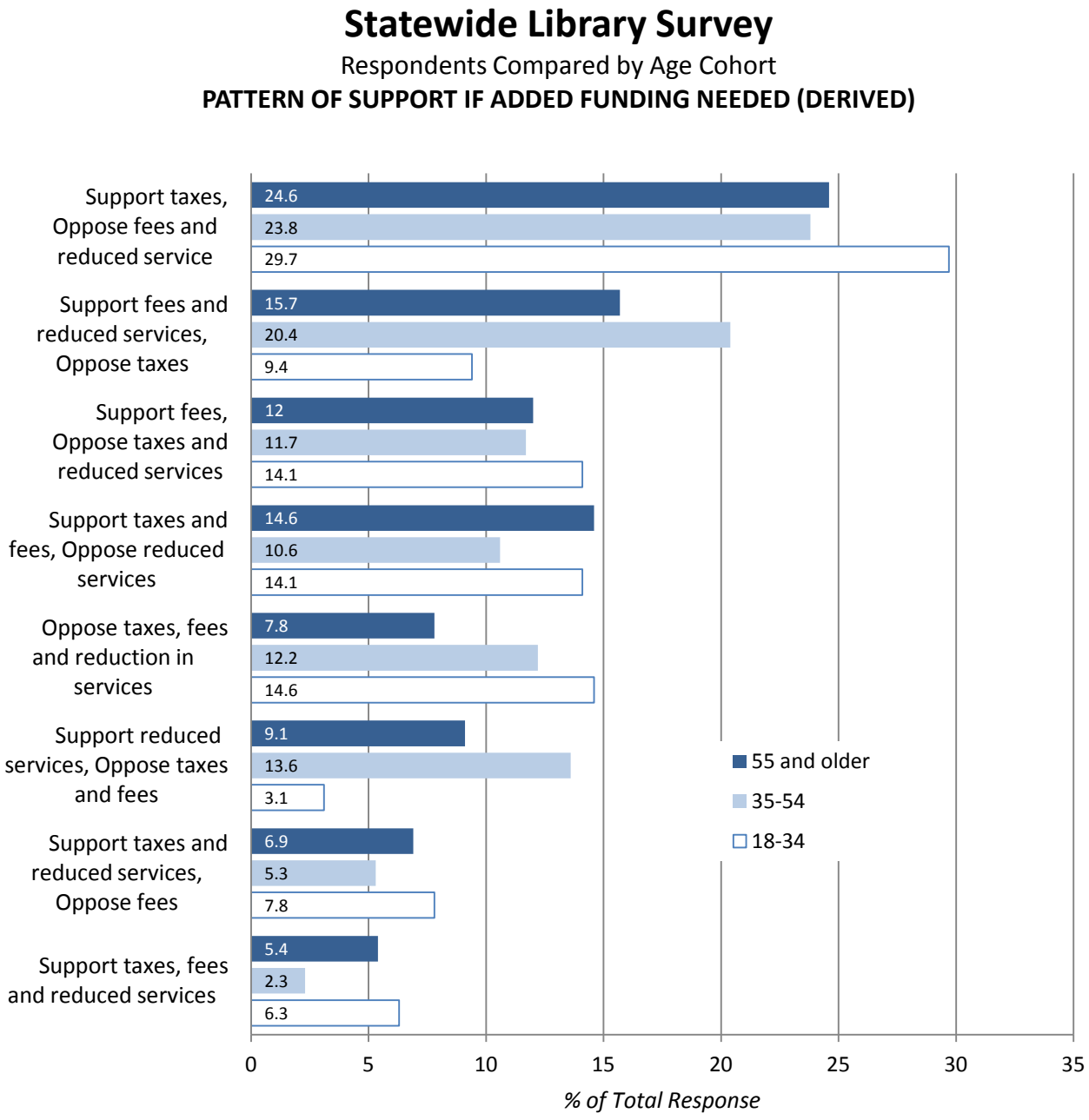
As shown in the following figures, the middle group (35–54, born 1956–1975) is more likely to support reduced services (42% vs. 26% for the youngest group, and 38% for the oldest). Overall, the middle group is less likely to support taxes as an option (42% compared to 59% for the youngest group, and 50% for the oldest group).

FIGURE 20. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY AGE COHORT: IF PUBLIC LIBRARY NEEDED ADDITIONAL FUNDS TO CONTINUE OPERATION, DO YOU SUPPORT



As with other library user groupings, the age cohort can be analyzed in relation to patterns of support, as follows.

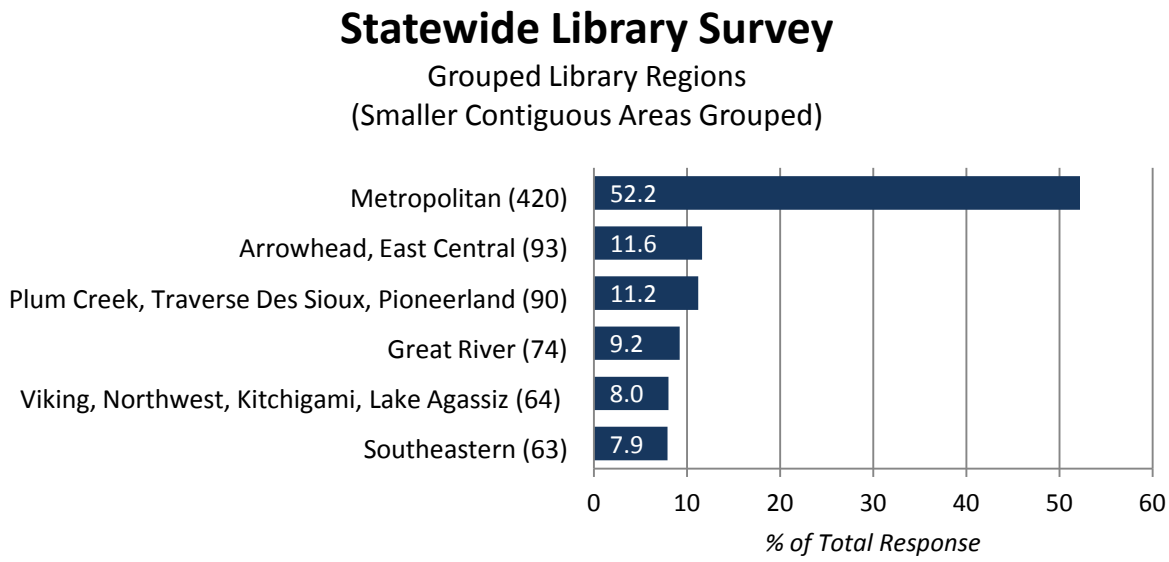
FIGURE 21. STATEWIDE LIBRARY SURVEY, RESPONDENTS BY AGE COHORT: PATTERN OF SUPPORT IF ADDED FUNDING NEEDED (DERIVED)



LIBRARY REGIONS

Because of the distribution of Minnesota's population, the Omnibus Survey sample does not include sufficient cases to permit a statistical analysis of all library regions. Thus, in this analysis, some contiguous smaller regions were combined. The Arrowhead/East Central regions lie along the eastern side of Minnesota above the Twin Cities Metropolitan area. Three combined regions—Plum Creek, Traverse des Sioux, and Pioneerland—lie in the southwestern part of Minnesota. Four combined regions lie along the northern and western side of Minnesota—Viking, Northwest, Kitchigami and Lake Agassiz. The Metropolitan and Great River regions and the Southeastern region were not combined with other regions for this analysis. The constitution of these smaller, contiguous regions, including percentage of the state and number of respondents, are presented in the following figure:

FIGURE 22. STATEWIDE LIBRARY SURVEY, SMALLER CONTIGUOUS AREAS GROUPED



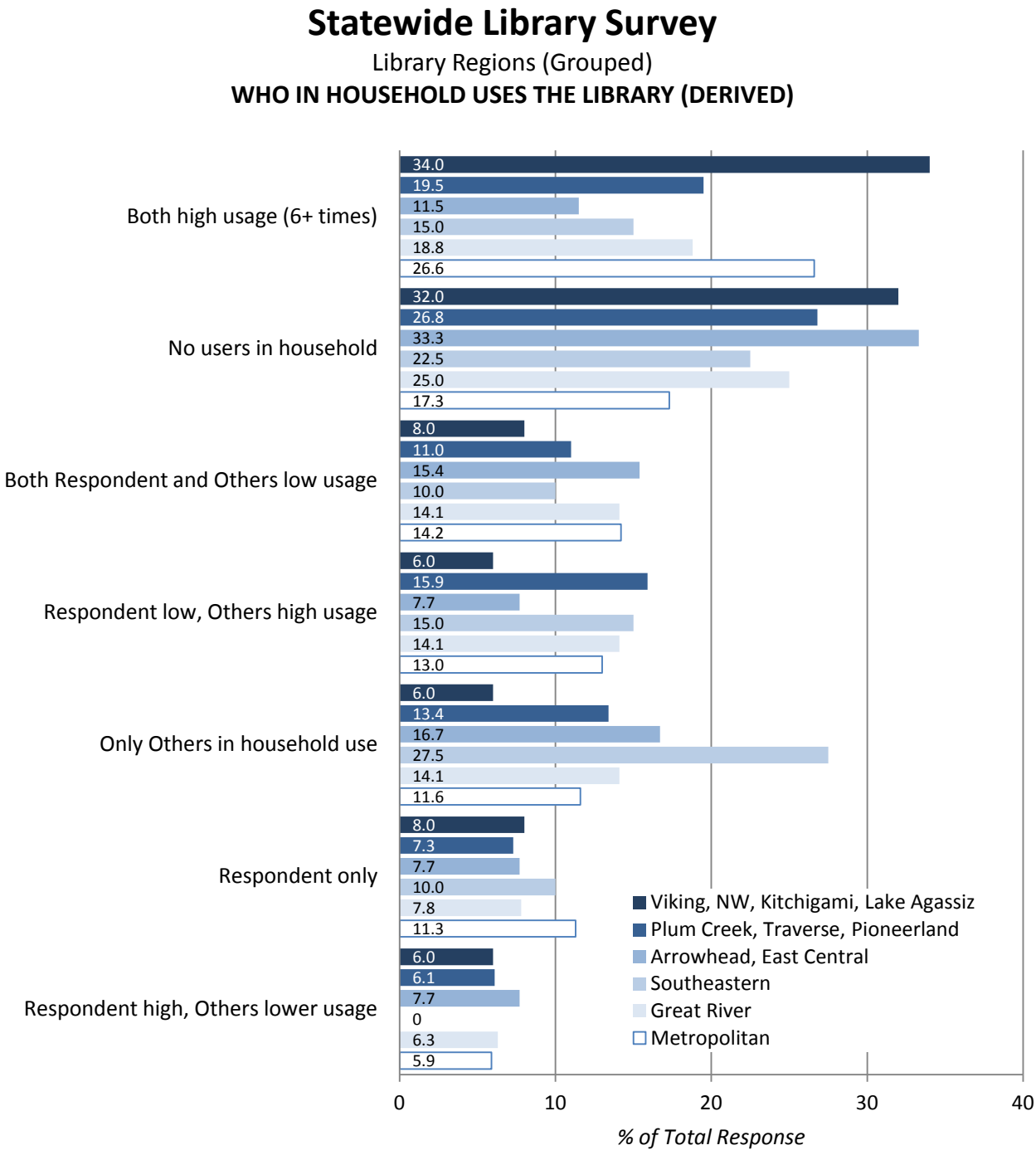
There is a statistically significant difference in the respondent's report of household usage of public libraries in 2010, prior to their interview in October/November. The highest reported usage was in the Metropolitan area (83%) and the lowest in the Arrowhead/East Central region (66%). Household usage for other regions is 78% for Southeastern, 75% for Great River, 74% for Plum Creek/Traverse/ Pioneerland, and 69% for Viking/NW/Kitchigami/Lake Agassiz region.

Further Analysis (Derived). The type of household usage also differs by these six regions. Among the more notable differences are the following: The Metropolitan and Viking et al. regions have the highest percentage where both respondent and others in the household are high public library users (27% for Metro and 34% for Viking et al.). Metropolitan, Great River and Arrowhead et al. have higher percentages where both the respondent and others in the household are low public library users (14%,

14% and 15% respectively). The Southeastern region has the highest percentage where only others in the household, not the respondent, used the public library in the past year (28%).

- **The highest reported usage was in the Metropolitan area (83%) and the lowest in the Arrowhead/East Central region (66%). Household usage for other regions is 78% for Southeastern, 75% for Great River, 74% for Plum Creek/Traverse/ Pioneerland, and 69% for Viking/NW/Kitchigami/Lake Agassiz region.**

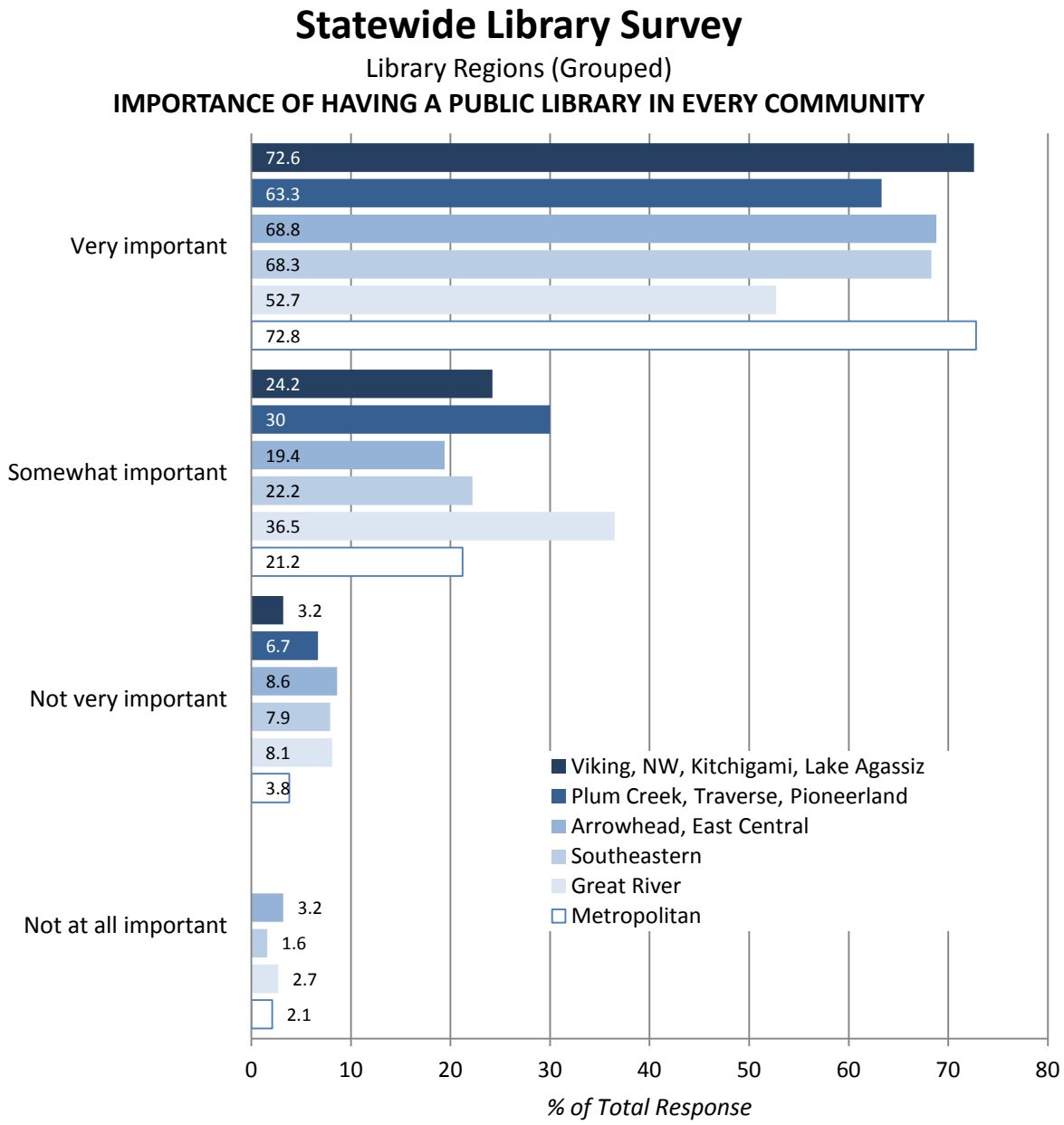
FIGURE 23. STATEWIDE LIBRARY SURVEY, SMALLER CONTIGUOUS AREAS GROUPED: WHO IN HOUSEHOLD USES THE LIBRARY (DERIVED)



Further Analysis (Derived). There is a significant difference across these six library regions in the pattern of use of public libraries. The Metropolitan and Viking et al. regions have a higher percentage of respondents who say that both they and others in their household were high users (6 times or more) of the public library in 2010 before their interview in October/November (27% and 34% respectively) and the Arrowhead et al. region was the lowest (12%). The Southeastern region was highest in the percentage of households where only others, not the respondent, used the public library (28%) and Viking et al. was the lowest in this regard (6%). Compared to other regions, Metropolitan and Southeastern regions were highest in having only the respondent use a public library (11% and 10%).

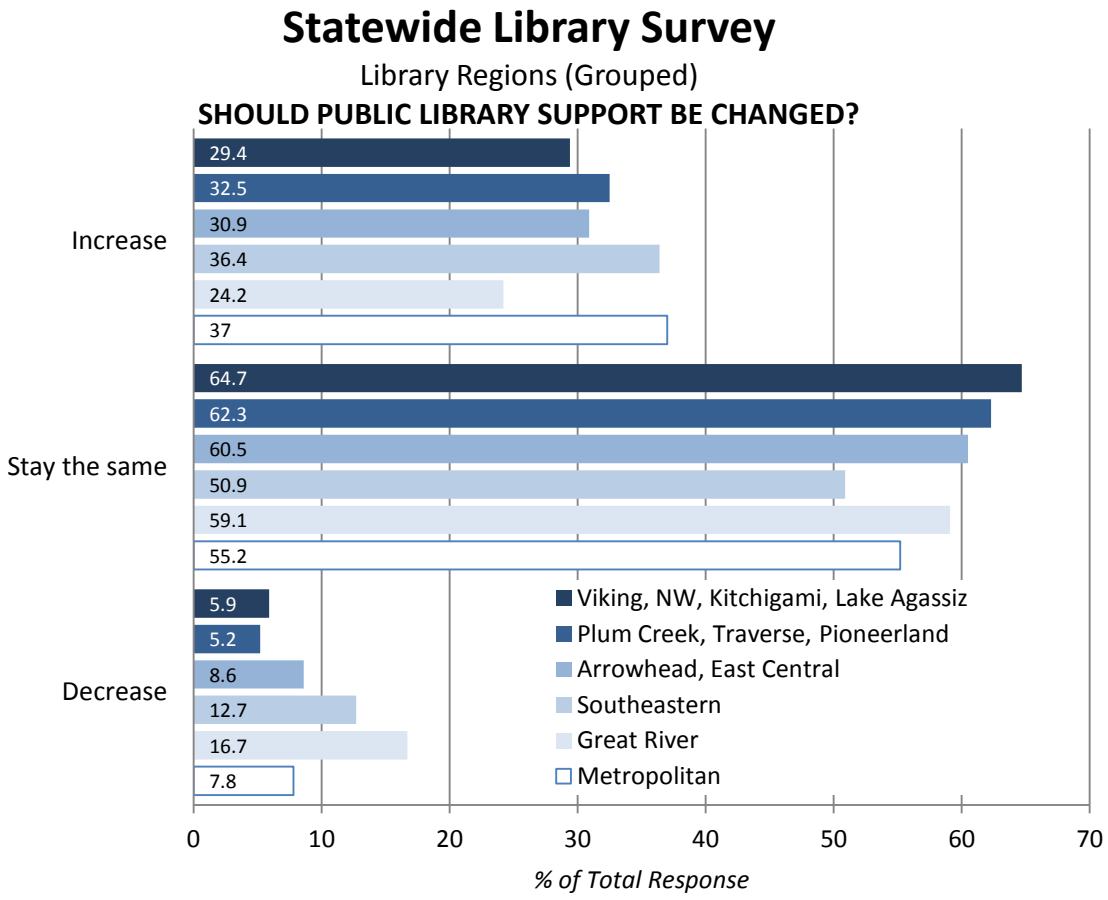
These six regional areas do not differ significantly in responses to the importance of having a library in every community (all indicate it is important by similar high percentages).

FIGURE 24. STATEWIDE LIBRARY SURVEY, SMALLER CONTIGUOUS AREAS GROUPED: IMPORTANCE OF HAVING A PUBLIC LIBRARY IN EVERY COMMUNITY



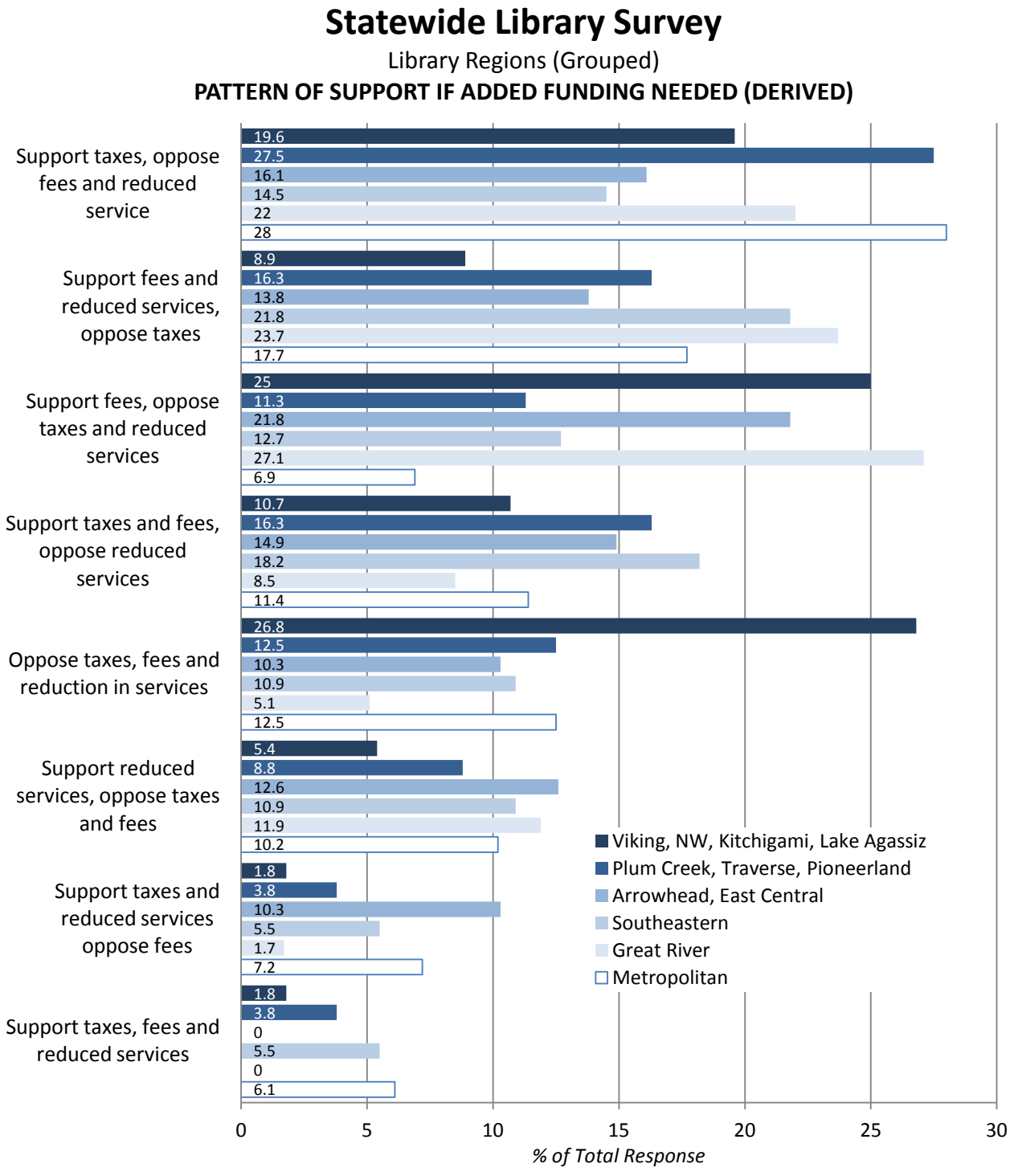
They also do not differ significantly in responses to whether library support ought to be increased, remain the same or be decreased (a strong majority favor keeping it the same, and about a third favor increases).

FIGURE 25. STATEWIDE LIBRARY SURVEY, LIBRARY REGIONS (GROUPED): SHOULD PUBLIC LIBRARY SUPPORT BE CHANGED?



Further Analysis (Derived). Overall responses on support for three sources of funding should additional funds be needed to continue operations show no statistically significant difference across these six regional areas in support for user fees. There are statistically significant differences in support for taxes and for reducing services. The Metropolitan and Plum Creek et al. regions more strongly favor using taxes for needed additional funding (52% for both), with Great River and Viking et al. regions being least in favor of this option (30% and 36%). The Metropolitan and Southeastern regions are most in favor of reducing services among these six regions (41% and 47% respectively), with the Viking et al. region lowest in support for reducing services (20%).

FIGURE 26. STATEWIDE LIBRARY SURVEY, LIBRARY REGIONS (GROUPED): PATTERN OF SUPPORT IF ADDED FUNDING NEEDED



CONCLUSION

Overall, this survey of the general population indicates that Minnesotans feel that public libraries are a very important part of any community and that public library funding should remain the same or be increased. If additional resources are needed for a public library to continue, there are divergent views about using user fees, taxes and/or reducing services. The most frequently favored option is to use taxes, not user fees and/or reduced services (24%). However, the next most favored option is to seek user fees and/or reduced services and not taxes (17%). Findings vary by the pattern of respondent and household use of public libraries and several of the background items included in the Omnibus Survey, These items include household income, respondent gender, age and geographic location as reported in the body of this report and in data in Appendix B. However, the main conclusion from the survey is that Minnesotans feel public libraries are important and that their support should be maintained or increased.

Future research should cover a broader set of topics about use of public libraries, availability of other resources, and trends in usage over time with developing technology. It would also be helpful to include questions about a broader variety of ways that public libraries are valued and evaluated by users and non-users.

II. USER SURVEY: MINNESOTA HOUSEHOLD VALUATION OF PUBLIC LIBRARIES

The value of bundled library services is estimated using an economic valuation survey of public library users in Minnesota.

The results suggest the average household would be willing and able to donate between $31.7 and $38.3 US dollars annually, resulting in a total donation for Minnesota's approximately 2,061,882 households of $65.4 to $79.0 million annually.

These estimated amounts should be considered "snapshots," as demand conditions can change frequently.

Note: Appendix material to this section includes a technical discussion of assumptions, modeling, statistical analyses, and the questionnaire used to gather data.

INTRODUCTION

Economists are often asked to determine how much something is worth, or to estimate the "value" of that thing. While this may seem relatively simple, even competitive markets for private goods do not typically provide the information necessary to complete this task. This is due to the separation of value and price. Value is the amount that a particular good or service is worth to an individual (or household). Price is the amount at which that good or service can be purchased.

Markets allocate goods and services based on the relationship between value and price. Rational households are expected to purchase the good or service if their value exceeds the price they must pay for it. Value can be subjective such that there must be a way to estimate it (as opposed to knowing the true amount); in markets, value is based on willingness and ability to pay since households must be both willing and able to pay a supplier's price to receive the good or service. Therefore, willingness and ability to pay is typically used as a proxy in measuring value.

The goal of this part of the study was to estimate the total value of Minnesota's public library services. This value is used in the study to estimate the return on investment.[1] While economists have developed several valuation estimation techniques, none are perfect. Here we use the most direct way of trying to

[1] Note that the goal is not to estimate the efficient level of each public library service. That would require estimation of the demand and supply curves for each service to determine where marginal value equaled marginal costs.

value public library services—a survey was developed to ascertain a proxy of household's willingness and ability to pay—also referred to as the Contingent Valuation Method. Statistical techniques were then used to estimate the total value of Minnesota's public library services.

BACKGROUND

The Contingent Valuation Method approach has become a standard approach in valuing non-private goods and services such as environmental resources as well as many other services provided by government. The method relies on direct valuation, typically asking survey respondents to state their willingness to pay for a small hypothetical increase in the amount of non-private good or service offered. Because of the hypothetical nature of this valuation, as well as other concerns, a group of economists (the"NOAA panel," see Appendix C) offered recommendations regarding how to properly implement a Contingent Valuation Method such that the results would be considered reliable. The NOAA panel suggests that the Contingent Valuation Method be framed in the context of a referendum. This is usually accomplished by asking respondents whether they would be willing to pay a given amount in extra taxes to pay for a small change in the good or service.

Public library services are typically paid for using property taxes, and are lumped together with many other goods and services not related to the libraries. Few Minnesota citizens are likely to know the current amount they are paying in property taxes toward their public libraries, which muddies the baseline comparison. If the question is framed as an additional $50, but no one knows how much is currently being paid, the decision becomes more complicated. Theory would predict the extra value to decline as additional amounts of service were offered. Local tax amounts and rates differ significantly in Minnesota, and to answer survey questions accurately a respondent would be required to know detailed information about their current property taxes, which is clearly impractical. Therefore, in the user valuation survey for the Minnesota Libraries' ROI project, respondents were not asked to consider any amount they are currently indirectly contributing to libraries through property taxes. Rather respondents were asked to frame the willingness to pay questions as a voluntary donation. (Many if not most Minnesotans have experience with voluntary donations: For example, respondents are likely to have considered donations to services offered at religious institutions, or in support of the Public Broadcasting Services).

The library offers many goods and services. In this analysis, respondents were asked to value the total bundle of goods and services offered by the library. The bundling of library services does not seem unreasonable given that many such decisions are made by the typical household on an annual basis. (In our Return on Investment chapter, on the other hand, we estimate the total value of library services and programs by a cost based approach.)

Although the Contingent Valuation Method is not perfect, for this application the preferred criteria of simple and familiar seem highly defensible. Appendix D of this report provides greater detail on the methodology of the willingness to pay questions.

SURVEY DESIGN

After an introductory script, respondents were asked to consider the services provided by PBS to all who have access, and if they would be willing to make a donation of a given value. Next, respondents were asked to consider public library services. They were provided a list of the most popular services and asked whether anyone in their household had used those within the past year. The survey continued with the public library valuation questions.

Conditional questions followed to assist in separating protest bidders and hypothetical bias. If they answered "no" to both library valuation questions they were asked to list why. Five common answers were provided for "yes" or "no" responses and other reasons (open ended) were allowed.

If respondents answered "yes" to at least one library valuation question they were asked to assess the likelihood they would pay the agreed amount if contacted today to collect: "very likely," "somewhat likely," "not very likely," and "not at all likely," were the scripted options.

Due to overlapping demographics, the valuation survey was relatively short. The final two questions were used to ensure matching with the state survey. Year of birth and gender were the variables that allowed for concatenation. Appendix D of this report provides greater detail on the survey design.

DATA COLLECTION

The Minnesota Center for Survey Research (MCSR) facilitated the data collection by drawing statewide from the household sample used in the 2010 Minnesota State Survey. A total of 557 surveys were completed for an overall response rate of 74%.

Using the 2010 Minnesota State Survey sample provided several key benefits. First, having a recent sample of known working numbers and willing participants saved time and money and allowed for a high response rate. Second, the state survey asked several questions about library use, the importance of libraries, and how changes in library services should be funded. Therefore, our respondents had considered many important aspects of libraries within six months of completing the valuation survey.[2] Finally, the state survey asked many demographic questions which did not then have to be repeated in the valuation survey.

[2] Note that year of birth and gender where used to verify the same respondent for both surveys.

The completed surveys then needed to be reviewed before statistical analysis could begin. As is typical in Contingent Valuation Method, many surveys were eliminated. Some respondents do not trust surveys, how the surveys will be used, or the library to spend money wisely; these are referred to as protest bidders and are typically eliminated since they may value library services but allow other considerations to determine their decisions. Others either volunteered that they did not understand the questions or it was determined they did not.[3]

In addition, some respondents indicated that their households would pay but when asked, if contacted today, the likelihood they would pay answered "Not very likely" or "Not at all likely." This is an indication of hypothetical bias, saying "yes" because it is hypothetical and will not actually be collected. Also, some respondents either refused to answer one or more willingness to pay questions or volunteered an answer of "don't know."

Finally, a few respondents were removed because they were either not the same respondent in the state survey or were very confused based on overlapping demographic questions between the two surveys. The final sample for statistical analysis included 429 observations. Appendix D of this report provides greater detail on the data collection.

STATISTICAL ANALYSIS

The goal of this analysis is to estimate value for library services by statistical methods. This can be as simple as estimating a standard theoretical demand function such as Q = f(P, others) where quantity demanded is a function of the price of the good or service and "others" are the usual suspected variables that can influence demand such as prices of substitute goods and services, number of buyers, tastes and preferences.

Many possibilities for independent variable inclusion and splitting the sample were considered and tested. Using the Krinsky and Robb (1986) procedure 5,000 draws from the estimated distributions were recorded. For those models separating income groups the number of draws for each group was based on our sample result of 18% missing with the rest distributed according to the household income census breakdowns of Minnesota (US Census, 2009). These draws can be thought of as willingness to pay of individual households for the bundled library services. After being arrayed, willingness to pay curves (demand curves) can be created. It is suggested that the confidence intervals be combined by taking the extremes of the lower and upper bounds to create a final interval for the mean and median.

[3] This was accomplished by responses to open ended questions; a typical answer might be "We're not willing to pay because we pay for it using taxes." when the WTP question asked them to not consider taxes when determining their donation.

The results seem highly practical. On average, a household would be willing to contribute between $32 and $38 annually to continue bundled library services for all. While not directly comparable, the mean donation seem in line with the price for annual memberships of many potential substitutes. Appendix D of this report provides greater detail on the statistical analysis.

DISCUSSION

In policy applications the mean and median have different interpretations. Herein, since each household's willingness to pay is represented by a draw from the distribution to purchase one library service bundle the total donation can be found by summing all these individual household donations. Therefore, the estimated range of total donation for library services in Minnesota is found by multiplying our mean interval by the estimated 2,061,882 households in the state (US Census, 2009).

The median is the 50th percentile of the distribution. From a policy perspective it is the donation amount where a simple majority is obtained. Therefore, a simple majority of households would be willing and able to donate between $31.8 and $42.8 for library services per year.[4]

TABLE 1. VALUATION OF MINNESOTA'S PUBLIC LIBRARIES

Estimated Number of Households in the State	*Mean Interval*	*Donation Amount (Simple Majority)*	*Total Donation for Minnesota's Households*
2,061,882		$31.8 - $42.8	$65.4 to $79.0 million annually

The survey was conducted during a period of slow growth after a lengthy recession. Markets are dynamic, it is best to consider these results as a snapshot of library value for the time of the study. Many factors influence demand including (perhaps the most relevant to this study) changes in tastes and preferences, prices of substitute goods and services, income, and number of buyers. Due to these considerations, it is suggested that rather than making subjective adjustments to the current study findings the valuation be repeated if it is thought that economic conditions severely hampered the results.

[4] It is tempting to suggest that this is equivalent to the amount of tax that would pass in a statewide referendum for library services. However, since taxes are typically paid by all whereas donations are expected to be provided only by those who value the good or service the two are not the same (see background section for a defense of using donations in this application).

III. ECONOMIC IMPACT OF MINNESOTA PUBLIC LIBRARIES

Capital Expenditures: The impact of payroll (the value added measure) associated with public library capital expenditures delivers an impact of more than $35.5 million dollars to the State. The impact of sales (the output measure) associated with public library capital expenditures delivers an impact of more than $65.3 million dollars to the State. The impact of jobs (the employment measure) associated with public library capital expenditures delivers an estimated total impact of 528 jobs to the State, including the 327 jobs directly related to library capital expenditures, as well as 201 additional (induced and indirect effect) jobs dependent on the libraries' capital expenditures in the State.

Operations: The impact of payroll (the value added measure) associated with public library operations delivers an impact of more than $260.8 million dollars to the State. The impact of sales [services] (the output measure) associated with public library operations delivers an impact of more than $366.4 million dollars to the State. The impact of jobs (the employment measure) associated with public library operations delivers an estimated total impact of 3,674 jobs to the State, including the 2,470 jobs directly related to library operations, as well as 1,204 additional (induced and indirect effect) jobs dependent on the libraries' operations in the State.

IMPACT PROCEDURES AND INPUT ASSUMPTIONS

IMPLAN MODELS

There are two components to the IMPLAN system, the software and databases. The databases provide all information to create regional IMPLAN models. The software performs the calculations and provides an interface for the user to make final demand changes. IMPLAN software version 3 was used in this analysis.

Comprehensive and detailed data coverage of the IMPLAN study areas by county, and the ability to incorporate user-supplied data at each stage of the model building process, provides a high degree of flexibility both in terms of geographic coverage and model formulation, in this case definition of the State of Minnesota and the definition of specific models for construction and operations. Using the IMPLAN software and data, BBER identified the libraries' proposed expenditures in terms of the sectoring scheme for the model, in producer prices, in historical dollars based on the year of the model, and applied those dollars spent within Minnesota for the impact analysis.

DATA

IMPLAN data files use federal government data sources including:

US Bureau of Economic Analysis Benchmark I/O Accounts of the US
US Bureau of Economic Analysis Output Estimates
US Bureau of Economic Analysis REIS Program
US Bureau of Labor Statistics County Employment and Wages (CEW) Program
US Bureau of Labor Statistics Consumer Expenditure Survey
US Census Bureau County Business Patterns
US Census Bureau Decennial Census and Population Surveys
US Census Bureau Economic Censuses and Surveys
US Department of Agriculture Crop and Livestock Statistics

IMPLAN data files consist of the following components: employment, industry output, value added, institutional demands, national structural matrices and inter-institutional transfers.

Impacts for this model use the most recent IMPLAN data available which is for the year 2009. The impact is reported in 2009 dollars.

Economic impacts are made up of direct, indirect, and induced impacts. The following cautions are suggested assumptions for accepting the impact model:

- IMPLAN input-output is a production based model.
- Local or export based purchases that represent transfers from other potential local purchases are not counted.
- The numbers (from U.S. Department of Commerce secondary data) treat both full and part time individuals as being employed.
- Assumptions need to be made concerning the nature of the local economy before impacts can be interpreted.

DEFINITIONS USED IN THIS REPORT

The IMPLAN models for both operations and capital outlays use the following definitions for the three measures and three effects of the impact reports:

MEASURES

Value Added — *A measure of the impacting industry's contribution to the local community; it includes wages, rents, interest and profits.*

Output — *Represents the value of local production required to sustain activities.*

Employment — *Estimates are in terms of jobs, not in terms of full-time equivalent employees. Hence, these may be temporary, part time or short term jobs.*

EFFECTS

Direct — *Initial spending in the study area resulting from the project.*

Indirect — *The additional inter-industry spending from the direct impact.*

Induced — *The impact of additional household expenditure resulting from the direct and indirect impact.*

INDUSTRY DEFINITIONS

IMPLAN models for this study used the industrial sector for "Employment and Payroll for State and Local Government Non-Education." IMPLAN provides a bridge table which identifies the corresponding Bureau of Economic Analysis (BEA) sector, as well as the North American Industry Classification (NAICS) code equivalents. In the case of sector 437, because this sector is comprised of institutional final demand, no BEA and NAICS equivalents are present.

TABLE 2. INDUSTRY DEFINITION

IMPLAN Sector	*Description*	*BEA*	*NAICS*
437	Employment and Payroll for State and Local Government Non-Education	--	--

MODEL ASSUMPTIONS

Special considerations for interpreting these impact numbers include the following cautions:

Regional indirect and induced effects are driven by assumptions in the model. One problem is that the assumptions can mask the true multiplier. This is especially true of the assumption of constant returns to scale: This assumption most affects induced effects and says that if I drink coffee, and my income increases, I will drink proportionally more than before. The amount of weight placed on the induced effects (the percentage of the total induced effect you would want to use) could be further analyzed with an in-depth impact study, involving much more specific data collection and more detailed analysis.

BBER suggests caution in regard to the interpretation of the tax impacts from these projects: Tax law changes frequently and will be difficult to forecast.

Finally, and most importantly, the relationship of Output to Employment has been set for the model by data provided by *Bibliostat Connect* (Bibliostat is an online resource that provides accurate information about local library services and funding) and state library administrators to the BBER; the modeling in this study is driven by inputs provided to the models by the best estimates of these sources.

The IMPLAN model contains information on state and local government operating budget expenditures, which includes other education and libraries spending patterns. For this impact, BBER used IMPLAN sector “State & Local Government" and "operating budget expenditures other education and libraries” to profile the non-payroll portion of the state libraries' budget. The payroll portion was run as a Labor Income Change activity.

Public libraries actually fall under State & Local Government Non-Education, which is a final demand institutional sector and the model was run as an Institution Spending Pattern activity type. However, the State and Local Government Non-Education spending pattern is quite broad, including things like police, highways, parks and etc. The "State and Local Government operating budget expenditures other education and libraries" spending pattern was imported from another model.

Sector 437 is a payroll-only sector and accounts for the labor and value added portions of government institution operations. This sector exists so that government institutions can "purchase" their employment and payroll. When running a government spending pattern using the Institution Spending Pattern activity type, purchases from this "sector" represents the payroll portion of the governmental budget. BBER specified this spending pattern to adjust the non-payroll portion of the library budget. The payroll portion was then run as a Labor Income Change activity.

THE ECONOMIC IMPACT OF PUBLIC LIBRARY SERVICES

BBER used *Bibliostat Connect* for data on Minnesota public library expenditures and operating revenues. With the addition of the Census module, public library staff and trustees use these data to benchmark the local library's progress in keeping up with trends and clearly show how the library compares with other libraries of similar size and demographic characteristics. The Minnesota Department of Education (MDE) State Library Services division collects Minnesota public library program statistics and financial data. Policymakers, regional library administrators, and the general public can use these data to evaluate and plan public library development and services. Minnesota public libraries visit the Bibliostat Connect Website to develop charts and tables comparing local public library program outputs with those of other U.S. public libraries. This service is funded annually through the federal Library Services and Technology Act. See more about this data source at http://connect. informata.com/.

The total operating expenditures are comprised of the Bibliostat variables of Staff, Collections, and Other.

MINNESOTA PUBLIC LIBRARY EXPENDITURES

TABLE 3. MINNESOTA PUBLIC LIBRARY EXPENDITURES

Minnesota Public Library Expenditures, Fiscal Year 2010

Expenditure Item	*Amount*	*Percent of Total*
Total Operating Expenditures on Staff	$139,418,701	66.4%
Total Operating Expenditures on Collection	$24,671,538	11.8%
Total Operating Expenditures on Other	$45,875,022	21.8%
Total Operating Expenditures	$209,965,261	100.0%
Total Capital Expenditures	$37,686,460	100%

Sources: Bibliostat

The total state and local government support for Minnesota's public libraries is $194,498,300. This is the value of support used for calculating ROI in this chapter.

PUBLIC LIBRARY REVENUE SOURCES

TABLE 4. MINNESOTA PUBLIC LIBRARY REVENUE SOURCES

Minnesota Public Library Revenue Sources, Fiscal Year 2010

Revenue Source	*Amount*	*Percent of Total*
Total Operating Income from State Government	$19,597,103	9.1%
Total Operating Income from Local Government	$174,901,197	81.6%
Total Operating Income from Federal Government	$655,446	0.3%
Total Operating Income from Other	$19,296,476	9.0%
Total Revenue	$214,450,222	100.0%

Sources: Bibliostat, IMPLAN

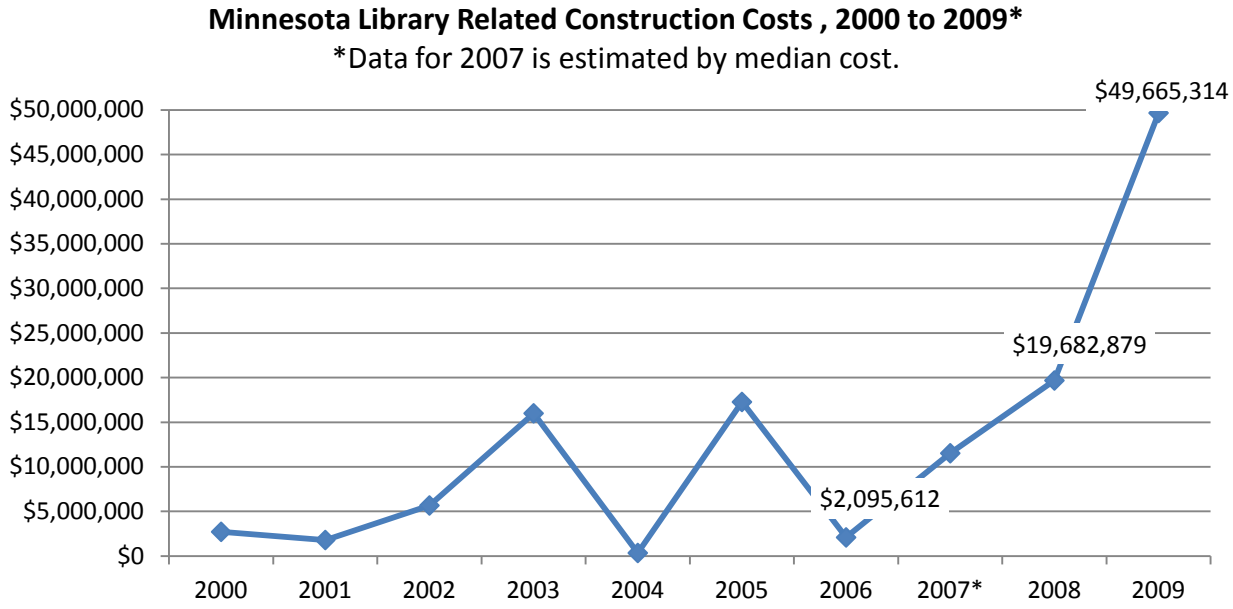
CAPITAL EXPENDITURE IMPACTS

This impact uses the value of all Minnesota libraries' 2010 capital expenditures, including construction, and furniture and fixtures as the direct effect input for modeling. Capital expenditures are spending on new, one-time items that are not part of the operational spending budgets of libraries. The IMPLAN model uses a multiplier calculation to show that for every dollar of direct spending libraries generate between $0.73 and $0.81 in additional spending in Minnesota's economy.

The impact of payroll (the value added measure) associated with public library capital expenditures delivers an impact of more than $35.5 million dollars to the State. The impact of sales (the output measure) associated with public library capital expenditures delivers an impact of more than $65.3 million dollars to the State.

Using data from Minnesota Department of Education on Public Library Construction Projects, BBER tracked construction costs by year from 2000 to 2009. Construction costs are the largest and most variable cost of those that comprise capital expenditures. In order to provide context for the direct input to the IMPLAN model, we reviewed the construction costs and capital expenditures over time.

FIGURE 27. MINNESOTA LIBRARY CONSTRUCTION COSTS, 2000 TO 2009



* 2007 data were not available to BBER. Therefore this data point is an average of 2000 to 2009.

Source: Bibliostat, MN Depart. Education

The $37 million of capital outlay used in our impact includes the 2010 construction expenditures.

The IMPLAN model uses a multiplier calculation to show that for every dollar of direct spending libraries generate on capital expenditures payroll, another $0.81 of additional spending is generated in Minnesota's economy. In the same way, for every dollar of direct spending libraries generate on capital expenditures (output measures), another $0.73 of additional spending is generated in Minnesota's economy.

TABLE 5. IMPACT OF MINNESOTA PUBLIC LIBRARIES' CAPITAL EXPENDITURES ON THE STATE OF MINNESOTA

Impact of Minnesota Public Libraries' Capital Expenditures on the State of Minnesota, in 2010 Dollars

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total*
Value Added	$19,631,984	$5,352,592	$10,530,336	$35,514,913
Output	$37,686,460	$9,668,418	$17,952,690	$65,307,568
Employment	327	58	142	528

Sources: IMPLAN, Bibliostat

The impact of jobs (the employment measure) associated with public library capital expenditures delivers an estimated total impact of 528 jobs to the State, including the 327 jobs directly related to library capital expenditures, as well as 201 additional (induced and indirect effect) jobs dependent on the libraries' capital expenditures in the State. These indirect and induced jobs, generated by direct library capital expenditure jobs include additional jobs in sectors of the Minnesota economy such as construction, wholesale and retail trade, refineries, real estate, architectural-engineering, hospitals, physicians and dentists and nurses, food services and drinking places, legal services, insurance carriers, telecommunications, transportation, power generation, and many more. In the same way, direct expenditures generate indirect and induced spending in the economy of the state. The following table shows the top twenty-five indirect and induced expenditures dependent on library capital expenditures.

TABLE 6. 25 TOP SECONDARY EXPENDITURES DEPENDENT ON DIRECT CAPITAL EXPENDITURES OF MINNESOTA PUBLIC LIBRARIES

25 Top Secondary Expenditures Dependent on Direct Capital Expenditures of Minnesota Public Libraries' in the State of Minnesota, in 2011 Dollars

Description	*Direct*	*Indirect*	*Induced*	*Total*
Total	$37,686,460	$9,668,418	$15,837,745	$63,192,623
Construct new nonresidential manufacturing	$35,425,272	$0	$0	$35,425,272
Wholesale trade businesses	$2,261,188	$1,720,073	$928,136	$4,909,397
Petroleum refineries	$0	$1,031,183	$449,824	$1,481,007
Real estate establishments	$0	$390,238	$948,598	$1,338,836
Architectural- engineering- and related	$0	$1,059,280	$51,482	$1,110,762
Private hospitals	$0	$1	$1,075,568	$1,075,570
Offices of physicians- dentists- and other	$0	$1	$1,031,791	$1,031,793
Food services and drinking places	$0	$114,071	$878,883	$992,954
Legal services	$0	$481,606	$258,420	$740,026
Insurance carriers	$0	$95,378	$628,852	$724,230
Monetary authorities and depository credit in	$0	$158,034	$447,837	$605,871

Nondepository credit intermediation	$0	$132,792	$373,824	$506,617
Telecommunications	$0	$242,474	$182,670	$425,145
Management of companies and enterprises	$0	$233,754	$181,875	$415,629
Transport by truck	$0	$213,625	$177,946	$391,572
Accounting- tax preparation- bookkeeping	$0	$258,909	$89,481	$348,390
Electric power generation- transmission	$0	$122,788	$225,170	$347,959
Nursing and residential care facilities	$0	$0	$302,230	$302,230
Other state and local government enterprises	$0	$41,243	$249,043	$290,286
Retail Stores - Food and beverage	$0	$2,481	$275,832	$278,313
Commercial and industrial machinery	$0	$245,135	$14,847	$259,982
Retail Stores - General merchandise	$0	$3,138	$247,072	$250,210
Services to buildings and dwellings	$0	$127,275	$115,005	$242,280
Automotive repair and maintenance- except car	$0	$126,102	$108,117	$234,220
Employment services	$0	$148,081	$84,215	$232,296
As well as more than $9 million in an additional 405 sectors of the economy . . .				$9,231,778

Source: IMPLAN

OPERATIONS IMPACTS

This impact uses the value of all MN libraries' 2010 operations' expenditures as the direct effect input for modeling. The IMPLAN model uses a multiplier calculation to show that for every dollar of direct spending on operations payroll, libraries generate $0.53 in additional spending in the economy of Minnesota. In the same way, for every dollar of direct spending on operations services, libraries generate $0.74 in additional spending in Minnesota's economy.

The impact of payroll (the value added measure) associated with public library operations delivers an impact of more than $260.8 million dollars to the State. The impact of sales [services, or the output measure) associated with public library operations delivers an impact of more than $366.4 million dollars to the State.

TABLE 7. IMPACT OF MINNESOTA PUBLIC LIBRARIES' OPERATIONS ON THE STATE OF MINNESOTA

Impact of Minnesota Public Libraries' Operations on the State of Minnesota, in 2010 Dollars

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total*
Value Added	$170,069,128	$14,760,941	$75,984,549	$260,814,618
Output	$210,077,345	$26,718,563	$129,689,549	$366,485,456
Employment	2,470	178	1,026	3,674

Sources: IMPLAN, Bibliostat

The impact of jobs (the employment measure) associated with public library operations delivers an estimated total impact of 3,674 jobs to the State, including the 2,470 jobs directly related to library operations, as well as 1,204 additional (induced and indirect effect) jobs dependent on the libraries' operations in the state. These indirect and induced jobs, generated by direct library operations jobs include additional jobs in sectors of the Minnesota economy for publishers, real estate, power generation, wholesale and retail businesses, and many others.

In the same way, the direct spending from library operations generates indirect and induced spending in the economy of the state. The following table shows indirect and induced spending in the top twenty-five sectors of the economy dependent on library operations.

TABLE 8. 25 TOP SECONDARY EXPENDITURES DEPENDENT ON DIRECT OPERATIONS OF MINNESOTA PUBLIC LIBRARIES

25 Top Secondary Expenditures Dependent on Direct Operations of Minnesota Public Libraries' in the State of Minnesota, in 2010 Dollars

Description	*Direct*	*Indirect*	*Induced*	*Total*
Total	$210,077,345	$26,718,563	$114,683,671	$351,479,579
Special (S&LG Non-Ed Emp & Payroll)	$139,416,935	$0	$0	$139,416,935
Book publishers	$19,425,043	$9,094	$113,560	$19,547,697
Real estate establishments	$0	$1,622,399	$6,999,297	$8,621,696
Electric power generation- transmission	$6,579,338	$308,657	$1,652,477	$8,540,472
Wholesale trade businesses	$0	$1,595,489	$6,822,557	$8,418,046
Food services and drinking places	$1,565,000	$477,135	$6,357,973	$8,400,108
Maint & repair construct of nonresident	$6,996,378	$646,991	$418,162	$8,061,532
Private hospitals	$0	$44	$7,842,271	$7,842,315
Telecommunications	$5,411,560	$869,325	$1,333,959	$7,614,844
Offices of physicians- dentists- and other he	$0	$38	$7,510,782	$7,510,820
Other state and local government enterprises	$4,705,584	$346,013	$1,809,434	$6,861,031
Natural gas distribution	$5,203,677	$239,239	$952,628	$6,395,544
Civic- social- professional- and similar	$4,214,927	$136,782	$1,082,596	$5,434,305
Insurance carriers	$0	$386,299	$4,492,695	$4,878,995
Petroleum refineries	$0	$1,566,191	$3,283,365	$4,849,556
Monetary authorities and depository credit in	$0	$1,058,997	$3,266,101	$4,325,098

Printing	$2,362,656	$782,370	$320,230	$3,465,257
Transport by truck	$1,545,743	$631,706	$1,277,455	$3,454,904
Nondepository credit intermediation	$0	$468,057	$2,688,304	$3,156,360
Newspaper publishers	$2,280,181	$168,532	$168,733	$2,617,447
Legal services	$0	$604,316	$1,877,973	$2,482,289
US Postal Service	$1,632,186	$334,413	$355,723	$2,322,322
Nursing and residential care facilities	$0	$0	$2,185,340	$2,185,340
Retail Stores - Food and beverage	$0	$43,409	$1,972,042	$2,015,452
Management of companies and enterprises	$0	$651,246	$1,324,077	$1,975,323
As well as more than $71 million in an additional 380 sectors of the economy . . .				$71,085,892

Source: IMPLAN

FEDERAL, AND STATE AND LOCAL TAXES FROM LIBRARY SPENDING

Minnesota residents pay property taxes for owning real property within the state, and property taxes in Minnesota pay for public services like libraries as well as schools and other public buildings.

Also, libraries are exempt from sales tax on purchases of tangible items, telecommunication services, and most other services. However, libraries must still pay sales or use tax on meals and lodging, and must also pay the solid waste management tax on waste collection and disposal services. Contractors who do work for libraries normally must pay tax on all materials used on the construction contract. The library's exempt status may not be used to exempt materials used by contractors under a lump-sum construction contract covering both labor and materials. The only time a contractor can buy materials without paying tax is when the materials are used on a construction contract with an exempt entity and the entity authorizes the contractor as their purchasing agent under specific rules.[5] All sales to the federal government and its agencies are exempt. The State of Minnesota uses a Direct Pay Permit, which means (as outlined above) that state agencies do not pay tax to the seller on most purchases.

Given this relationship between Minnesota's public libraries and the tax structure of the state and the federal government, our IMPLAN model reports the following statewide tax impacts of Minnesota Public Libraries' Capital Expenditures and Operations.

[5] Interested readers can find more on the tax exempt status of Minnesota's libraries, and review Fact Sheet 128, Contractors and Revenue Notice #95-5: Sales and Use Tax - Construction Contracts - Purchasing Agent Ex-emption for additional information on construction con-tracts with exempt entities at http://taxes.state.mn.us/sales/Documents/publications_fact_sheets_by_name_content_BAT_1100110.pdf

TABLE 9. TAXES GENERATED BY MINNESOTA PUBLIC LIBRARIES' CAPITAL EXPENDITURES AND OPERATIONS PAID TO THE STATE OF MINNESOTA, AND TO THE U.S. GOVERNMENT, 2009

Description	*Employee Compensation*	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*	*Total*
CAPITAL EXPENDITURES:						
Total Federal Tax	$2,626,645	$260,494	$316,322	$1,509,471	$289,364	$5,002,296
Total State and Local Tax	$50,113	n.a.	$1,745,041	$788,621	$215,162	$2,798,937
Total	$2,676,758	$260,494	$2,061,363	$2,298,092	$504,526	$7,801,233
OPERATIONS:						
Federal Gov Non-Defense	$22,535,511	$355,301	$1,589,484	$10,797,651	$2,400,615	$37,678,562
State/Local Non-Education	$429,952	n.a.	$8,768,651	$5,641,220	$1,785,022	$16,624,845
Total	$22,965,463	$355,301	$10,358,135	$16,438,871	$4,185,637	$54,303,407
Grand Totals	**$25,642,221**	**$615,795**	**$12,419,498**	**$18,736,963**	**$4,690,163**	**$62,104,640**

IV. RETURN ON INVESTMENT IN MINNESOTA LIBRARIES

In our chapter on return on investment, the rate of return by public libraries to investment by Minnesota taxpayers is calculated in terms of benefits per dollar of operating tax revenue, and by library service.

ROI is estimated at $4.62 for every taxpayer $1 generated in support of Minnesota's public libraries.

The three approaches to estimating the value of Minnesota's libraries reported in this study show how differing methodologies and different sets of assumptions can deliver different results in a final ROI. In this study, the lowest estimation is $2.56 and the highest $4.62. BBER suggests that the low estimate has more secure assumptions while the high estimate is more comparable with the state to state results reported in other studies.

RETURN ON INVESTMENT METHODOLOGY AND FINDINGS

In a previous chapter of this report, the Contingent Value Method was used to estimate of the value of a bundle of public library services to Minnesotans, based on survey responses. In this chapter on return on investment (ROI), we compare the information from this statistical valuation to a cost-based approach and estimate total economic value.

ROI is often compared to expected or required rates of return, and for this purpose we present the ROI findings from several comparable states' library studies. Also, for the sake of comparability, we inventory library services and programs and estimate their worth based on a consensus of estimation methodologies from comparable state studies. Specifically, the Minnesota ROI employs a similar methodology to a recent ROI study from Wisconsin (2008).

Elsewhere it has been noted that the concept of return on taxpayer investment can assist libraries in demonstrating the benefits of private-public financial partnerships, such as private-sector gift or grant programs to leverage library services beyond those paid for by taxes.[6]

[6] Measuring Your Library's Value: How to Do a Cost-Benefit Analysis for Your Public Library, Donald S. Elliott, Glen E. Holt, Sterling W. Hayden, Leslie Edmonds Holt. ALA Editions. Chicago, 2007.

CALCULATING RATE OF RETURN

As described above, the performance measure used to evaluate the efficiency of an investment such as tax payers' investment in public libraries is most often the ratio known as the Return on Investment, or ROI. We calculated the efficiency of public library funding by taxpayers by first calculating the total economic contribution of Minnesota's public libraries divided by the population served by the libraries. Then we calculated state and local support per capita. The per capita contribution divided by the per capita state and local tax support equals the ROI.

ESTIMATING TOTAL ECONOMIC CONTRIBUTION

The total economic contribution of Minnesota's public libraries is estimated as follows according to a cost-based method, and is based on estimates made for the recent Wisconsin library study (2008), but here inflated to 2010 dollars.

Children's Programs - According to Bibliostat, total attendees in these programs in Minnesota in 2010 was 878,248. Multiplied by the resulting per attendee value ($4.32), we get the total value of the children's programs which is $3,794,031.

Young Adult Programs - According to Bibliostat, total attendees in these programs in Minnesota in 2010 was 75,633. Multiplied by the resulting per attendee value ($4.32), we get the total value of the young adult programs which is $326,735.

Adult Programs - According to Bibliostat, total attendees in these programs in Minnesota in 2010 was 320,558. Multiplied by the resulting per attendee value ($6.48), we get the total value of the adult programs which is $2,077,216.

Total Adult Circulation - According to Bibliostat, total adult circulation in Minnesota in 2010 was 34,824,173. Multiplied by the circulation per item value ($7.48), we get the total value of the adult circulation which is $260,484,814.

Total Juvenile Circulation - According to Bibliostat, total juvenile circulation in Minnesota in 2010 was 22,677,363. Multiplied by the circulation per item value ($6.48), we get the total value of the juvenile circulation which is $146,949,312.

Other Circulation - According to the Bibliostat category designated "other," total other circulation in Minnesota in 2010 was 1,380,274. Multiplied by the circulation per item value ($4.75), we get the total value of other circulation which is $6,556,302.

Public Internet Computers – The basic methodology for calculating the value of computer and internet access is based on estimates made for the recent Wisconsin library study (2008), but here inflated to 2010 dollars. Bibliostat reports traffic estimated at 7,070,855 access events, valued at $4.32 each, resulting in a total value of $30,546,094.

Reference Transactions – The basic methodology for calculating the value of reference transactions is based on estimates made for the recent Wisconsin library study (2008), but here inflated to 2010 dollars. Bibliostat reports reference transactions numbering 3,591,200. These are valued at $4.32 each, resulting in a total value of $15,513,984.

From these assumptions and calculations, the following economic value of Minnesota public library services of $466,248,487, is derived:

TABLE 10. ECONOMIC VALUE OF MINNESOTA PUBLIC LIBRARY SERVICES (DERIVED)

The Economic Value of MN Public Library Services

	Attendance or Circulation	*Economic Value*
Children's Programs	878,248	$3,794,031
Young Adult Programs	75,633	$326,735
Adult Programs	320,558	$2,077,216
Total Adult Circulation	34,824,173	$260,484,814
Total Juvenile Circulation	22,677,363	$146,949,312
Other Circulation	1,380,274	$6,556,302
Public Internet Computers	7,070,855	$30,546,094
Reference Transactions	3,591,200	$15,513,984
Total Economic Value		$466,248,487

Assumptions: BBER adjusted values for library programs and materials as follows: Children's Programs ($4.32); Young Adult Programs ($4.32); Adult Programs ($6.48); Total Adult Circulation ($7.48); Total Juvenile Circulation ($6.48); Other Circulation ($4.75); Public Internet Computers ($4.32); and Reference Transactions ($4.32).

We then sum the total value of library services plus the economic impact estimated by the IMPLAN model. The following table is from the IMPLAN model reported in the previous chapter on the economic impact of Minnesota public libraries.

TABLE 11. TOTAL ECONOMIC CONTRIBUTION, FISCAL YEAR 2010

Contributor	*State Economy*
Library Operations	$366,485,456
Capital Outlays	$65,307,568
Total Contribution	$431,793,024

Source: IMPLAN

The sum of these two estimations gives the total economic contribution to be used in the ROI calculation.

TABLE 12. TOTAL ECONOMIC CONTRIBUTION OF MINNESOTA PUBLIC LIBRARIES

Total Economic Contribution Of Minnesota Public Libraries

	2010 Economic Contribution
Direct Economic Impact	$431,793,024
Value of Library Services	$466,248,487
Total Economic Contribution	$898,041,512

As noted above, the methodology BBER used for this calculation is as follows: We first calculated the total economic contribution of Minnesota's public libraries ($898,041,512) divided by the population served by the libraries (5,303,925). Then we calculated state and local support per capita ($169.32). The per capita contribution divided by the per capita state and local tax support ($36.67) equals the ROI ($4.62).

TABLE 13. THE RETURN ON INVESTMENT OF PUBLIC LIBRARY SERVICE IN 2010

The Return on Investment of Public Library Service in 2010

Total Economic Contribution of Minnesota Public Libraries	$898,041,512
Minnesota Population served by Public Libraries	5,303,925
Economic Contribution Per Capita	$169.32
Local and County Tax Support Per Capita	$36.67
Dollar Annual Return Per Dollar of Public Tax Support	$4.62

RATE OF RETURN COMPARISONS

Although an average reader may not need to consider the technical bases for determining ROI, recent critiques of libraries' effort to value their services has presented the opportunity to refine and discuss the methodologies involved. The following section briefly presents BBER's attempt to place the ROI analyses in a larger research context.

Comparison between the Contingent Valuation Method and the Cost Based Approach. Our analysis provides estimations from the IMPLAN model for library valuation amounts. BBER has also used a cost-based approach to estimate the value of the library, based on assumptions shared with other studies, about multiplier values for children's programs, young adult programs, adult programs, total adult circulation, total juvenile circulation, other circulation, public internet computers, and reference transactions. Finally, BBER has presented the value of the library in terms of the contingent valuation survey findings. In order to compare these results, and to further comment on the methodology and

findings for the what the library is worth, BBER suggests that it is helpful to compile a range of reasonable values.[7]

Low and High Ranges for ROI by Method. In order to suggest a meaningful range, BBER ran the IMPLAN model using two approaches. The IMPLAN model uses an input-output matrix to estimate employment, value added and output measures in the economy of the state. The model also uses multipliers as a numeric way of describing secondary economic impacts in the state. IMPLAN's Social Accounting System or SAM matrix can be compared with IMPLAN's Type I as supportable multiplier analyses.[8] Table 5 in the IMPLAN Impact chapter (Impact of Minnesota Public Libraries' Capital Expenditures on the State of Minnesota) shows these large induced effects in the findings of the model. The multipliers from both matrices are compared in the following table.

TABLE 14. IMPLAN OUTPUT MULTIPLIERS

Multipliers	*Output*
Type I Operations	1.13
SAM Operations	1.74
TYPE I Capital	1.26
SAM Capital	1.73

The difference in these multipliers is because the induced effects are included in the SAM multipliers. Specifically, the payroll amount moving through household spending accounts for this effect. These multipliers are used to model the value of library output (services).

TABLE 15. RANGE OF IMPLAN MODELING RESULTS

	Low (Type I)	*High (SAM)*
Operations and Capital		
Operations	$236,795,907	$366,485,456
Capital	$47,213,217	$65,307,568
Total	$284,009,124	$431,793,024

The range from the cost-based approach is suggested in the value assumptions for books, DVDs, etc. as used by comparable studies in various states. BBER studied these various assumptions and found the Wisconsin values as the most reasonable values.

[7] The probability of the point estimate (or the survey valuation mean, or the true value of the cost-based estimate, or the IMPLAN multiplier estimate) actually occurring is 0.00.

[8] Type I multipliers do not incorporate induced effects resulting from the household expenditures from new labor income. Type SAM multipliers are the direct, indirect, and induced effects where the induced effect is based on information in the social account matrix. This relationship accounts for social security and income tax leakage, institution savings, and commuting. It also accounts for inter-institutional transfers.

TABLE 16. TOTAL ECONOMIC CONTRIBUTION OF LIBRARIES: IMPLAN RANGES AND COST-BASED RANGES

	Low (Type I)	*High (SAM)*
Operations and Capital		
Operations	$236,795,907	$366,485,456
Capital	$47,213,217	$65,307,568
Materials Circulation		
Economic Value of Minnesota Public Library Services (Derived)	$466,248,487	$466,248,487
Total	$750,257,611	$898,041,511

To use the valuation directly in ROI, we use the total from IMPLAN (in table 11) and add the valuation [65.4 million, 79 million] to construct a range of ROI using this measure. We estimate this range as [2.56, 2.63]. It is possible to make this range wider by using a low estimate from IMPLAN (using the SAM matrix), in which case the low estimate from the valuation would be ($65.4 million) and the high estimate from IMPLAN would be (type I), using a high estimate from the valuation of ($79 million).

TABLE 17. TOTAL ECONOMIC CONTRIBUTION OF LIBRARIES: IMPLAN RANGES AND CONTINGENT VALUATION RANGES

	Low	*High*
Operations and Capital		
Operations	$236,795,907	$366,485,456
Capital	$47,213,217	$65,307,568
Contingent Valuation	$65,000,000	$79,000,000
Total	$349,009,124	$510,793,024

Range of all ROI estimates	**$2.56 —$4.62**

This study shows how differing methodologies and different sets of assumptions can deliver different results in a final ROI. The range of ROI found with these methods also closely reflects the range found in studies from other states. For our study, the lowest estimation is $2.56 and the highest $4.62. BBER suggests that the low estimate has more secure assumptions while the high estimate is more comparable with the state to state results reported in other studies.

On the low end: Comparing IMPLAN values, cost-based values, and survey valuation amounts, the total in table 10 of $466 million would suggest an average household value ($466million/2.06million = $226/household) which is over 5 times the high estimate from the survey valuation. The implied values

from the raw valuation data in the appendix material show as a rough estimate a minimum of 80% of the sample is willing to pay less than $200/household.

Commentary on estimating the value of public library services by states suggests that the estimation of the value of libraries using a cost-based approach can vary widely and include many arbitrary assumptions.[9] In BBER's study for the public libraries of Minnesota, more confidence is perhaps warranted by the methodology presented in the IMPLAN and survey valuation chapters. That said, while we can imagine that providing an ROI of $2.56—which would be the most conservative and lowest survey valuation result—may generate concern when compared to ROI estimates from various states reported in recent years which range from $7.50 to $2.49. BBER would also point to ALA's publication "Worth Their Weight: An Assessment of the ***Evolving*** Field of Library Valuation" and highlight the word *evolving*.

Finally, putting other studies aside and focusing on the big picture, the idea that a $1 investment leads to a $2.56 return seems encouraging. Although we do not know exactly what kind of ROIs other agencies are generating for other states (do they consider the opportunity cost of investing in libraries, for example) that kind of return compares well with studies reporting such findings as ROI for K-12 education (range $0.19, $1.18).[10]

Comparisons with recent findings from other states. Comparisons with a sampling of recent findings from other states show that Minnesotans enjoy a somewhat greater rate of return than the mean ($4.23) for this sample collection of other state's findings. Readers should bear in mind that differences in research methodology and assumptions from state to state can make these comparisons difficult to confirm.

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[9] As noted at arl.org: At the recent ACRL conference in Philadelphia, Jim Neal (Columbia) presented a thoughtful critique of ROI, signaling Carol Tenopir's Lib-Value project as a bright exception. The text of his presentation, "Stop the Madness: The Insanity of ROI and the Need for New Qualitative Measures of Academic Library Success," is freely available for download from the conference proceedings website. Also at the ACRL conference, Denise Pan, Gabrielle Wiersma, and Yem Fong (Colorado) discussed a pilot study inspired by the original ROI study at the University of Illinois at Urbana-Champaign. The text of their presentation, "Towards Demonstrating Value: Measuring the Contributions of Library Collections to University Research and Teaching Goals," is also available for free download from the conference proceedings website. For an overview of ACRL conference presentations about measuring library value, see the April 1 CHRONICLE OF HIGHER EDUCATION article by Jennifer Howard, "College Librarians Look at Better Ways to Measure the Value of Their Services."

[10] The cost burden to Minnesota K-12. Wilder Research, December 2008, for the Bush Foundation. At The cost burden to MINNESOTA K-12 when children are unprepared ...www.wilder.org/download.0.html?report=2117

TABLE 18. COMPARISON OF MINNESOTA'S ROI WITH RECENT FINDINGS FROM OTHER STATES

Study	State	Unadjusted ROI
Taxpayer Return on Investment in Florida Public Libraries (2004)	FL	$6.54
Tax Payer Return on Investment in Pennsylvania Public Libraries (2003)	PA	$5.50
The Economic Value of Vermont's Public Libraries (2006-2007)	VT	$5.05
Public Libraries – A Wise Investment A Return on Investment Study of Colorado Libraries (2009)	CO	$4.99
Minnesota Public Libraries' Return on Investment (2011)	**MN**	**$4.62**
Placing Economic Value ... the Middle Country Public Library in Suffolk County, NY (2005-2006)	NY	$4.59
Economic Impact of Public Libraries in South Carolina (2005)	SC	$4.48
The Economic Value of the Port Jefferson Free Library in Suffolk County, New York (2010)	NY	$4.14
The Economic Contribution of Wisconsin Public Libraries to The Economy of Wisconsin (2008)	WI	$4.06
Placing an Economic Value on the Services of Public Libraries in Suffolk County (2005-2006)	NY	$3.93
Economic Benefits of Public Libraries: Value for Money (2006)	OH	$3.81
Placing Economic Value on the...Northport-East Northport Public Library in Suffolk County, NY (2005-2006)	NY	$3.30
Carnegie Library of Pittsburgh: Community Impact and Benefits Individual Library (2006)	PA	$3.00
Placing Economic Value on the...Mastic-Moriches-Shirley ...Library in Suffolk County, NY (2005-2006)	NY	$2.97
The Economic Impact of Libraries in Indiana (2007)	IN	$2.38
	Mean	$4.22
	Median	$4.14

V. SOCIAL RETURN ON INVESTMENT IN MINNESOTA LIBRARIES

Monetized impacts and other benefits from annual operations in 2010 delivered a payroll impact of more than $260.8 million dollars, a sales [services] impact of more than $366.4 million dollars, and an employment impact of an estimated 3,674 jobs to the State.

However, the social return on investment from Minnesota public libraries is greater than simply the measureable return on investment. Other benefits of significant value include the collection of materials itself, and the many services of the library; the educational programs, as well as the educational benefits of the library's mission including literacy of the citizenry; technology for use in the library; the expertise of the library staff; the library facility as a community gathering place; the "halo" spending by library users at establishments close to the library; and the value of a library's enhancement to neighborhood real estate and community partnerships.

Although the need for public funding and competition from the Internet can be negative aspects for libraries, stakeholders, inside and outside the library represent library users with children or grandchildren; employees from the community at large, who check out materials for use at their workplace, as well as job seekers; library users who contact public library reference libraries for information; and technology users with a need for Internet access.

The definition we found most useful for describing what is meant by the social return on investment (SROI) for this library study is the following: "SROI is a quantitative measurement of how effectively an organization uses its capital and other resources to generate value for society."[11] We use the previous chapter's economic impact estimation to report financial return for the State. We use the information and feedback gathered in the library valuation survey to monetize the perception of benefit by Minnesotans. We review recent similar states' findings of SROI. We also suggest there are implications for Minnesota's state legislative policy from these findings.

SIGNIFICANT POSITIVE AND NEGATIVE VALUE GENERATED BY PUBLIC LIBRARIES FOR MINNESOTA

The positive ability of Minnesota's public libraries to generate value for the people of the State is significant. The negative aspects of public libraries are fewer and more difficult to describe.

[11] Alison Lingane and Sara Olsen, Guidelines for Social Return on Investment, California Management Review 46(3)116-135, Spring 2004. At http://libraryassessment.org.

MONETIZED IMPACTS AND OTHER BENEFITS

As shown in the foregoing economic impact analyses, for every dollar of direct operations spending libraries generate between $0.53 and $0.74 in additional spending in Minnesota's economy. The impact of payroll (the value added measure) associated with public library operations delivers an impact of more than $260.8 million dollars to the State. The impact of sales [services] (the output measure) associated with public library operations delivers an impact of more than $366.4 million dollars to the State. The impact of jobs (the employment measure) associated with public library operations delivers an estimated total impact of 3,674 jobs to the State, including the 2,470 jobs directly related to library operations, as well as 1,204 additional (induced and indirect effect) jobs dependent on the libraries' operations in the State.

The valuation of Minnesota's public libraries as perceived by users, as measured by willingness and ability to pay, was studied in the previous valuation chapter. The value of bundled library services was estimated using an economic valuation survey of public library users in Minnesota. The results suggest the average household would be willing and able to donate between $31.7 and $38.3 US dollars annually, resulting in a total donation for Minnesota's approximately 2,061,882 households of $65.4 to $79.0 million annually. Although these estimated amounts should be considered "snapshots," as demand conditions can change frequently, the value of libraries to the people of the state is clear.

Other benefits to Minnesota from its public libraries include the following:

The collection of materials in the library has value. Minnesota's public libraries are like libraries in other states in that they are valued for providing free access to educational and entertainment materials, are an open and welcoming gathering place, and for providing resources to those who would otherwise be unable to afford them. A typical list of what comprises Minnesota library collections and downloads can include books and periodicals, professional journals, travel materials, audio books, DVDs, videos, music, and business resources.

Services of the library have value. These include interlibrary loans, classes and special programs, availability of home delivery, services for the disabled, assistance with resumes and job searches, tax forms, children's programs, bookmobiles.

The educational programs and materials, as well as the educational mission of the library have value. This includes the encouragement for young people to read (and the role libraries play in creating and cultivating readers), the constantly growing collection of resources and materials, the fact that everyone is welcome, and literacy programs.

The technology for use in the library has value. This includes computers and Internet access, specialized equipment for the disabled, online content, specialized databases, which possibly constitutes the only means of access for lower income families and individuals.

The expertise of the library staff has value. Staff include knowledgeable reference librarians and other staff, class instructors, volunteers, and people committed to maintaining the library.

The library facility as a gathering place has value. This includes the phenomenon known as the "living room" experience, meeting and conference rooms available, all-inclusive, safe and friendly environment, and a unique forum for social networking, book clubs and reading groups.

Proximity to the library has value. Users who stop at the library while completing a longer list of errands report "halo" spending at firms and establishments close to the library. Although this spending is not part of an economic impact statement of Minnesota's public libraries, it is also true that proximity to a library increases spending for those businesses located near the library.

Libraries have value to neighborhoods. People prefer to live near a public library if they have a choice, and often perceive library access as part of an enhanced quality of life, although it is rarely a direct factor in home purchase decision making.

Library partnerships have value. Because community engagement has value, involvement of library volunteers from the communities includes benefits for volunteers in terms of enhancing their confidence, skills and levels of employability.

NEGATIVE ASPECTS OF LIBRARIES

The need for funding can have negative aspects. Libraries need funding and because of funding shortages, libraries users may face shorter hours and fewer services because of funding restriction. Also related to funding, library users regularly wish for more space in their libraries.

Competition from the Internet can be a negative aspect for libraries. Libraries face growing competition from online sources of information; according to a recent PEW study,[12] more people turned to the Internet than any other source of information and support, including experts, family members, government agencies, *or libraries*. According to the PEW study, only 13% went to the public library when they had a research problem to address.

Libraries also recognize the need to be more strategic in recruiting volunteers and marketing library services.

STAKEHOLDERS: OUTSIDE THE LIBRARY AND IN THE STATE

[12] *Information Searches That Solve Problems: How people use the internet, libraries, and government agencies when they need help*, PEW / Internet & American Life Project and Graduate School of Library and Information Science, December 30, 2007

As seen in a review of ROI studies from many states in the US, there is a similarity of stakeholders for public library services. As in other states, Minnesota library users typically use the services of their nearest library. However, the state-wide, twelve-region system of Minnesota libraries is a benefit to users who also spend some time in libraries away from their own neighborhoods, or call for resources from other libraries in the State, in order to access a greater selection or wider variety of materials. Library users as parents check out materials for their children. A majority of library users with children or grandchildren report that they visit the public library and attend library events or classes at their library. Library stakeholders include employees from the community at large, who check out materials for use at their workplace. Also, a significant number of library users contact public library reference librarians for assistance with requests for general or specific information. Also, Minnesota is like other states in that technology users with a need for Internet access represent, in most studies, over half a state's library use.

As shown in the foregoing analysis of the survey of the general population, public library usage by households in Minnesota is very high. Seventy-eight percent of respondents reported that they or someone in their household used a public library in person or online in the year prior to the October/November survey (2010). Some 23% of respondents reported high usage (6 times or more) for themselves and others in their household. The survey of the general population also reported that the importance of public libraries to Minnesota adults is very high. Sixty-nine percent of respondents felt it was “very important” to have a public library in every community, and over 93% felt it was “somewhat important or very important.” Only 7% felt that having a public library in every community was not important. Given this level of involvement by Minnesotans, the level of support expressed by these stakeholders was also high. While 57% felt library support should stay the same as it is, 34% felt it should be increased and only 9% felt it should be decreased.

STAKEHOLDERS: INSIDE THE LIBRARY SYSTEM

Stakeholders from "inside" the library include those working in the Minnesota public library system as well as those dependent on those workers. The impact of jobs (the employment measure) associated with public library operations delivers an estimated total impact of 3,674 jobs to the State, including the 2,470 jobs directly related to library operations, as well as 1,204 additional (induced and indirect effect) jobs dependent on the libraries' operations in the State. These indirect and induced jobs, generated by direct library operations jobs include additional jobs in sectors of the Minnesota economy for publishers, real estate, power generation, wholesale and retail businesses, and many others.

PUBLIC LIBRARIES' COMPETITION

Are there library alternatives? What would Minnesotans spend if they had to pay for the same services elsewhere by purchasing or renting materials they currently have the option of borrowing from the library? Although most state reports include the finding that people would do without some of what

they now find at the library, others report they would bear the cost of more books and periodicals as well as the cost of renting more DVDs and videos if they did not have the option of borrowing them from the library. They would also do more of their own research online. The willingness-to-pay data from our library valuation survey has implications for estimating how much people believe they save by being able to borrow materials from the public library. Finally, although libraries compete for funding with other state programs, libraries are different from other services and industries. The general public and library stakeholders in Minnesota recognize the uniqueness and value of libraries' resources and service in supplying a large collection of materials, to basically everyone, at no direct cost.

RISK FACTORS

As tax-subsidized institutions, libraries compete with other public institutions and programs for a piece of the budgetary pie. Public expenditures from property taxes in support of libraries are subject to change.

On the other hand, economic impacts from federal, and state and local taxes paid by public libraries and related activity have been estimated to amount to a total of more than $54.3 million dollars from operations in 2010. In addition, federal, and state and local taxes paid by public libraries and related activity from capital expenditures in 2010 have been estimated to amount to a total of more than $7.8 million dollars.

IMPLICATIONS FOR POLICY

The number one issue for public libraries remains funding. To maintain the value generated by public libraries for the people of the State, and to adjust forward into an increasing knowledge-based economy, libraries will need support from voters and legislators. It is also clear, from opinions expressed in the survey of the general population, and from the user valuation survey that a tax referendum might pass, if additional funds were needed to support the services identified as of value to Minnesota library users. From the data gathering and analysis of this study, readers can and should conclude that the SROI is greater than the more narrowly calculated ROI, and that Minnesotans are willing and able to support their public libraries.

VI. COSTS AND BENEFITS OF MINNESOTA LIBRARIES

As most often implemented, cost/benefit analysis determines the most cost-effective solution among all those considered, not simply the least cost solution. In a strict sense, cost/benefit analysis is a detailed evaluation of the costs and benefits of selected alternatives identified during an alternatives analysis. This analysis includes costs of current and projected operations as a baseline for (1) determining which alternative to select for optimization and (2) measuring costs and benefits of the implemented and operational system over time. In a cost/benefit analysis, costs are normally expressed in dollars, but benefits can also be expressed in other quantitative or qualitative measures (for example, time reduction, or improved security).

Although the focus of this current study has been to determine ROI, many of the components of a cost/benefit analysis can also be discussed, using the measures and data presented in the ROI analysis. The topics below review findings previously discussed but which are refocused here in terms of costs and benefits. The fundamentals of a cost-benefit analysis for libraries can include the following: establishing the relationship of users to services through a service-user matrix; measuring what consumers would pay in full for the goods and services provided or using contingent valuation to determining willingness to pay; and estimating time, travel, and other expenses that library users encounter.

SERVICE-USER MATRIX

To perform a cost-benefit analysis for public libraries, one must credibly quantify the value of its services to the community and the costs associated with those services. Constructing a service-user matrix matches the services the library provides with its associated users. This requires significant analysis of needs of library users and the services provided to satisfy those needs.

To construct a service user matrix, BBER asked the Minnesota Center for Survey Research to survey library use of library services in a statewide sample of 804 respondents. This sample contained user groups identified by location, gender, income, library use, education, and age. A survey was drafted and questions about Minnesotan's use of library services included questions about who in the household uses the library; pattern of support if added funding needed; importance of having a public library in every community; should public library support be changed; and if public library needed additional funds to continue operation, do you support charging user fees, taxes to cover funds, or reducing services. This instrument was pre-tested with the assistance of public library staff in three of the twelve Minnesota library regions. The survey data were collected in the fall of 2010. Findings from the analysis of these data are reported in the first chapter of this report, and have been summarized as follows:

> Overall, our statewide survey of the general population of Minnesota households indicates that Minnesotans feel that public libraries are a very important part of a

community and that public library funding should remain the same or be increased. If additional resources are needed for a public library to continue, there are divergent views about using user fees, taxes and/or reducing services. The most frequently favored option is to use taxes, not user fees and/or reduced services. However, the next most favored option is to seek user fees and/or reduced services and not taxes. Findings vary by the pattern of respondent and household use of public libraries, and background items included in the statewide survey are also reported in the body of this report, including household income, respondent gender, age, and geographic location. The main conclusion from this survey is that Minnesotans feel public libraries are important and that their support should be maintained or increased. [Note: Appendix material to this section includes tables of detailed data findings, and the questionnaire used to gather data for this analysis.]

BBER also researched capital outlays and operating costs, identified sources of operating funds, and determined direct inputs for an input-output economic model in order to estimate the economic impact of Minnesota's public libraries on the State of Minnesota.

The economic impact on Minnesota's economy from capital outlays of public libraries is summarized as follows:

Impact of Minnesota Public Libraries' Capital Expenditures on the State of Minnesota, in 2010 Dollars

	Direct Effect	*Indirect Effect*	*Induced Effect*	***Total***
Value Added	$19,631,984	$5,352,592	$10,530,336	**$35,514,913**
Output	$37,686,460	$9,668,418	$17,952,690	**$65,307,568**
Employment	327	58	142	**528**

Sources: IMPLAN, Bibliostat

The economic impact on Minnesota's economy from the operations of public libraries is summarized as follows:

Impact of Minnesota Public Libraries' Operations on the State of Minnesota, in 2010 Dollars

	Direct Effect	*Indirect Effect*	*Induced Effect*	***Total***
Value Added	$170,069,128	$14,760,941	$75,984,549	**$260,814,618**
Output	$210,077,345	$26,718,563	$129,689,549	**$366,485,456**
Employment	2,470	178	1,026	**3,674**

Sources: IMPLAN, Bibliostat

Part of the economic impact of libraries are indirect and induced jobs, generated by direct library operations jobs, and they include additional jobs in various sectors of the Minnesota economy. These

jobs include employment for publishers, real estate agents, power generation workers, employees of wholesale and retail businesses, and many others. [Note: The chapter on Economic Impacts and IMPLAN modeling in this report includes tables of detailed data findings, definitions of measures and effects, and further explanation of these impact estimates.]

Part of the economic impact of libraries is also an estimation of taxes generated by public libraries.

TAXES GENERATED BY MINNESOTA PUBLIC LIBRARIES' CAPITAL EXPENDITURES AND OPERATIONS PAID TO THE STATE OF MINNESOTA, AND TO THE U.S. GOVERNMENT, 2009

Description	*Employee Compensation*	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*	*Total*
CAPITAL EXPENDITURES:						
Total Federal Tax	$2,626,645	$260,494	$316,322	$1,509,471	$289,364	$5,002,296
Total State and Local Tax	$50,113	n.a.	$1,745,041	$788,621	$215,162	$2,798,937
Total	$2,676,758	$260,494	$2,061,363	$2,298,092	$504,526	$7,801,233
OPERATIONS:						
Federal Gov Non-Defense	$22,535,511	$355,301	$1,589,484	$10,797,651	$2,400,615	$37,678,562
State/Local Non-Education	$429,952	n.a.	$8,768,651	$5,641,220	$1,785,022	$16,624,845
Total	$22,965,463	$355,301	$10,358,135	$16,438,871	$4,185,637	$54,303,407
Grand Totals	**$25,642,221**	**$615,795**	**$12,419,498**	**$18,736,963**	**$4,690,163**	**$62,104,640**

CONSUMER SURPLUS AND/OR CONTINGENT VALUATION

Consumer surplus is generally used in policy studies, and it represents monetary value consumers associate with a good or service in excess of any cost they incur to acquire that service. Measuring consumer surplus involves analyzing what consumers would pay in full for the goods and services provided. Through extensive surveying, one can ask users how many books they rent from the library, how many they purchase from a bookstore and how many more books they would purchase if library services were not available.

Contingent valuation asks the consumer directly how much they would pay or exchange for library services. This is done through the “willingness-to-pay” approach or the “willingness-to-accept” approach, this either measures how much they would pay to get the service, or how much one would accept to give up the service.

In our chapter on the Minnesota household valuation of public libraries, the value of bundled library services is estimated using an economic valuation survey of public library users in Minnesota. The results

suggest the average household would be willing and able to donate between $31.7 and $38.3 US dollars annually, resulting in a total donation for Minnesota's approximately 2,061,882 households of $65.4 to $79.0 million annually. These estimated amounts should be considered "snapshots," as demand conditions can change frequently. [Note: Appendix material to this report includes a technical discussion of assumptions, modeling, statistical analyses, and the questionnaire used to gather data for this valuation analysis.]

In our chapter on return on investment, the rate of return by public libraries to investment by Minnesota taxpayers is calculated in terms of benefits per dollar of operating tax revenue, and by library service. ROI is estimated at $4.62 for every taxpayer $1 generated in support of Minnesota's public libraries.

SOCIAL BENEFITS

In our chapter on the social return on investment, the quantitative and qualitative value of public libraries in Minnesota are discussed. The SROI from Minnesota public libraries is greater than the measureable ROI. Other benefits of significant value include the collection of materials itself, and the many services of the library; the educational programs, as well as the educational benefits of the library's mission; technology for use in the library; the expertise of the library staff; the library facility as a community gathering place; the "halo" spending by library users at establishments close to the library; and the value of a library's enhancement to neighborhood real estate and community partnerships.

Although the need for public funding and competition from the Internet can be negative aspects for libraries, stakeholders, inside and outside the library include library users with children or grandchildren; employees from the community at large, who check out materials for use at their workplace; library users who contact public library reference libraries for information; and technology users with a need for Internet access represent.

APPENDIX A: SURVEY OF GENERAL POPULATION METHODOLOGY

OVERVIEW

The 2010 Minnesota State Survey was conducted for the Bureau of Business and Economic Research (BBER) at the University of Minnesota Duluth, by the Minnesota Center for Survey Research at the University of Minnesota, Twin Cities. It is an omnibus survey of Minnesota adults 18 years or older. Annual omnibus surveys, conducted since 1984, include questions from a number of organizations. For the 2010 survey BBER was able to include five questions about public libraries (see Appendix A).

A randomly selected sample of Minnesota households from all Minnesota telephone exchanges is identified. A procedure is used to interview a random adult in the household so survey results can be generalized to households or to adults (with appropriate weighting). The telephone survey uses a computer assisted protocol. If necessary up to 10 repeat calls are made. A total of 804 interviews were completed for an overall response rate of 32% (completed interviews divided by valid phone numbers) and a cooperation rate of 46% (completed interviews among those contacted), relatively strong among current survey research. MCSR notes that declining response rates are a concern for all survey research organizations. The increasing number of surveys and changes in telephone technology may be among factors challenging research organizations.

The character of the times should be kept in mind in interpreting survey results, including this one. The survey was conducted in October and November, 2010. Among the significant events during the survey period was the mid-term national election in early November. Public issues at the time were concerns about the national debt level and assertions that taxes shouldn't be raised. Many states were feeling high debt and income shortfalls and looking for places to cut budgets. The right-wing "Tea Party" movement was particularly vocal during the election period with concerns about taxes and national debt. 2010 was also a year when there were some signs that the "Great Recession" was tapering off among financial institutions but unemployment remained high (near 9%) and many families were dealing with home foreclosures.

Since the survey period covered the period before and after the November 2nd election, an analysis was done of the pre and post election data. There was a statistically significant difference in reported use of the library during the year prior to the interview. Respondents interviewed after November 2nd reported somewhat greater household use of public libraries (74% before to 82% after), and this difference appears to be largely due to greater reported household use of public libraries by others in the household, rather than the respondent. However, there was no statistically significant difference before vs. after the election in view of the importance of having a public library in each community. There were differences in views about whether financial support for public libraries should be increased, decreased or remain the same with the percentage feeling it should be increased going up from 32% before the election to 37% afterwards, and the percentage feeling financial support should be decreased going up

from 7% to 11% after the election. Finally, although there were no overall before-after election differences in support for using taxes, user fees or reducing services to deal with any added resources needed to continue operation, there were statistically significant differences when the pattern of support for these three options were examined. The differences were relatively small and the patterns suggest cross currents of preference.

This report uses a weighted data file so that results can be generalized to Minnesota adults.

Interview Questions

The Bureau was able to included 5 questions in the longer "Omnibus" state-wide survey conducted annually by the Minnesota Center for Survey Research. The telephone survey was conducted in October and November, 2010. These questions are:

"The next questions are about public libraries."

1. Since the beginning of January this year, about how many times have you yourself visited a public library either in person or online…once or twice, three to five times, six to twelve times, thirteen to twenty times, or more than twenty times? (None, if volunteered, was also recorded).

(Two intervening questions asked about whether there were others living in the respondent's household and if any of these were age 18 or younger.)

2. *(If more than one person in the household)* Since January, about how many times TOTAL have the OTHER people in your household visited a public library either in person or on-line…once or twice, three to five times, six to twelve times, thirteen to twenty times, or more than twenty times? (None, if volunteered, was also recorded).

3. How important do you think it is that there be a public library in every community…very important, somewhat important, not very important, or not at all important?

4. In your opinion, should the amount of financial support that goes to public libraries be increased, stay the same, or be decreased?

5. Just suppose that your local public library needed additional funds to continue operation. Please tell me if you would support or oppose each of the following solutions.

Taxes being increased to cover necessary costs…support or oppose.

Charging those people who use the library…support or oppose.

The library reducing the services that it offers to the public…support or oppose.

In addition, the Omnibus Survey asks a number of other questions that were available for use in our analysis (e.g. age, income, county location)

MCSR METHODOLOGY LIBRARY SURVEY

STUDY DESIGN

The Library Survey was conducted as a telephone survey for the Minnesota Center for Survey Research (MCSR) at the University of Minnesota. The project was completed for the University of Minnesota Duluth Bureau of Business and Economic Research (BBER) with funding from the Minnesota Department of Education. The highest standards of quality survey research were employed in conducting this project.

The administrative coordination of the project was provided by the MCSR Director, Rossana Armson, who also provided assistance with questionnaire design, arranged for data collection, tested the CATI questionnaire, and prepared this methodology report. The MCSR Data Manager, Anne Caron, converted the CATI file into an SPSS file format for analysis, and appended the data from the 2010 Minnesota State Survey for each respondent.

QUESTIONNAIRE

The final version of the draft questionnaire was provided by Jean Jacobson on February 4 and had been created by Professor Christopher McIntosh with assistance from the BBER research team of Jean Jacobson, James Skurla, and Donald McTavish. It included the survey questions and an accompanying Excel file with values for the donation dollar amounts that created 16 different versions of the questionnaire (see Table 1).

The BBER research team had previously pretested the draft survey questions to determine the donation dollar amounts. The survey underwent several revisions, and the final questions were approved on March 4. Before data collection began on March 8, all 16 versions of the questionnaire were tested to confirm that the donation dollar amounts filled correctly into the programmed survey.

Respondents answered questions about their willingness to donate money to three specific nonprofit organizations (the Public Broadcasting Service, city parks close to where they live, and public libraries). Additional questions asked about their household's use of the public library, the most important reason they would not donate money to continue library services, and the likelihood that they would actually donate a specific amount if they were contacted today to donate to the public library.

These same individuals were interviewed in Fall 2010 for the Minnesota State Survey and were asked how many times they and other people in the household had visited a public library either in person or online since January 2010, how important it is that there be a public library in every community,

whether the amount of financial support that goes to public libraries should be increased or decreased, and whether they would support or oppose three possible solutions (increasing taxes, charging users, and reducing services) to the need for additional library funding.

SAMPLING

The sample for the Library Survey consisted of the 804 individuals who had previously completed a telephone interview for the 2010 Minnesota State Survey. The interviewer asked for the same person by name, if a name had been provided at the end of the first interview, otherwise they asked for the adult male (or female) in the household. A copy of the introduction is shown in Appendix B.

The initial survey sample for the 2010 Minnesota State Survey consisted of households selected randomly from all Minnesota landline telephone exchanges. The random digit telephone sample was obtained from Survey Sampling, Inc. of Fairfield, Connecticut. Known business telephone numbers were excluded from the sample. In addition, the selected random digit telephone numbers were screened for disconnects, by using a computerized dialing protocol which does not make the telephone ring, but which can detect a unique dial tone that is emitted by some disconnected numbers.

Selection of respondents occurred in two stages. First a household was randomly selected and then a person was randomly selected within the household. The selection of a person within the household was done using the Most Recent Birthday Selection Method. These selection procedures guaranteed that every landline telephone household in Minnesota had an equal chance to be included in the survey, and that once the household was sampled every adult had an equal chance of being included.

INTERVIEWING

Data collection was conducted from March 8 to April 7, 2011. Computer Assisted Telephone Interviewing (CATI) was the data collection technology used for this project.

Data Collection Subcontractor

Interviewers and supervisors were employees of Information Specialists Group, Inc. (ISG), a private subcontractor with a telephone facility located in Bloomington, Minnesota. They had also been the data collection subcontractor for the 2010 Minnesota State Survey.

Training of Interviewers

All of the ISG interviewers who worked on the Library Survey were experienced and had previously received basic instructions in survey interviewing. They all attended a training session that covered survey procedures and policies for this project and review of the actual survey questionnaire. In addition, each interviewer completed at least one practice survey before completing a follow-up interview.

Finally, all ISG interviewers had signed a statement of professional ethics that contains explicit guidelines about appropriate interviewer behavior and confidentiality of respondent information. A copy of this statement is included in Appendix B.

Computer Assisted Telephone Interviews

This project used the WinCati System for Computer Interviewing, from Sawtooth Software. With minimal editing, data were available immediately after completion of data collection.

To conduct interviews using CATI, each interviewer uses a microcomputer which displays questions on the computer screen in the proper order. The interviewer wears a headset and has both hands free for entering responses into the computer via the keyboard. Responses are entered as numbers, such as "1" for yes and "2" for no.

Supervision

Interviewers were supervised throughout the data collection process. Supervisory responsibilities included distributing new phone numbers, reviewing completed questionnaires for errors and omissions, monitoring interviews, and completing verification calls.

Monitoring

The silent entry monitoring system utilized at ISG enabled supervisors to listen to interviews and provide immediate feedback to interviewers regarding improvements in interviewing quality. This system allowed the monitor to hear both the interviewer and the respondent during the survey. Interviewers whose performance was not satisfactory were re-evaluated on subsequent shifts. During the four weeks of interviewing, XX percent of the interviews were monitored by ISG supervisors.

Operations

Interviews were conducted by telephone from the phone bank located at ISG. The interviewing was organized into evening and daytime shifts during weekdays and weekends.

Telephone numbers to be called were loaded electronically into WinCati, which distributed them to interviewers according to a predetermined call scheduling protocol. The disposition of each attempt to complete an interview was recorded in WinCati, using the disposition codes provided in Appendix B. Each telephone number in the sample continued to be called until it had been attempted at least ten times without success or until data collection ended on April 7.

Completed interviews were saved on the ISG computer network.

Answering Machine Messages

The sample for this study included many households with answering machines. Interviewers were instructed to leave a message stating they were calling on behalf of the University of Minnesota, and they would be calling back; or the respondent could call in to participate in the study. A copy of the answering machine message is included in Appendix B.

Verification

To verify that respondents were in fact interviewed, random respondents were selected and called back by a shift supervisor. A copy of the verification script is shown in Appendix B. A total of XX respondents (XX%) were contacted for verification and all confirmed that they had been interviewed.

Refusal Conversion

Many of the initial refusals were re-contacted by an interviewer. Four percent of the completed interviews had initially been refusals, and were completed when they were subsequently re-contacted.

DATA

After the data were transferred from the WinCati file to an SPSS file, a systematic examination was conducted to remove data entry errors. The data cleaning process involved using a computer program to evaluate each case for variables with out-of-range values. In addition, the file was examined manually to identify cases with paradoxical or inappropriate responses. The data from the 2010 Minnesota State Survey were appended to the file and responses to the questions about year of birth and gender were compared to confirm that the same individual had completed both interviews.

COMPLETION STATUS

A total of 557 telephone interviews were completed for the Library Survey (see Table 2). An additional 61 people refused to participate and 26 telephone numbers were still active when interviewing was terminated. The remainder of the sample was categorized as follows: 101 individuals were unreachable during ten or more attempted contacts, and seven individuals were not able to complete the survey because of physical or language problems. In addition, 52 telephone numbers were eliminated, 51 because they were not working telephone numbers, and one because the person had died since the initial interview had been completed. The overall response rate for the survey was 74% and the cooperation rate was 86%, based on formulas specified by the American Association for Public Opinion Research.

B. PUBLIC LIBRARIES

The next questions are about public libraries.

1. Since the beginning of January this year, about how many times have you yourself visited a public library in person or online . . . once or twice, three to five times, six to twelve times, thirteen to twenty times or more than twenty times?

   1. Once or twice
   2. Three to five times
   3. Six to 12 times
   4. Thirteen to 20 times
   5. More than 20 times (please specify) _____
   6. None (VOLUNTEERED)
   8. DK
   9. RA

2. (IF MORE THAN ONE PERSON IN HOUSEHOLD) Since January, about how many times TOTAL have the OTHER people in your household visited a public library in person or on-line . . . once or twice, three to five times, six to twelve times, thirteen to twenty times or more than twenty times?

   (INTERVIEWER: OTHER PEOPLE COMBINED, NOT INDIVIDUALLY)

   1. Once or twice
   2. Three to five times
   3. Six to 12 times
   4. Thirteen to 20 times
   5. More than 20 times (please specify) _____
   6. None (VOLUNTEERED)
   8. DK
   9. RA
   . NA

3. How important do you think it is that there be a public library in every community . . .

   very important, somewhat important, not very important, or not at all important?

   1. Very important
   2. Somewhat important
   3. Not very important
   3. Not at all important
   8. DK
   9. RA

4. In your opinion, should the amount of public financial support that goes to public libraries be increased or decreased, or is the current amount about right?

   1. Increased
   2. Decreased
   3. About right
   8. DK
   9. RA

5. Just suppose that your local public library needed additional funds to continue operation. Please tell me if you would support or oppose each of the following solutions.

   a. Taxes being increased to cover necessary costs
   b. Charging those people who use the library
   c. The library reducing the services that it offers to the public

RESULTS

Appendix B of this report contains the response frequencies and percentages for each question in the survey. The actual responses for all 557 individuals who completed the survey are shown for each question. Percentage distributions also are presented; valid percentages were computed after eliminating those who refused to answer, did not know, or were not required to answer a particular question.

APPENDIX B: SURVEY OF GENERAL POPULATION DETAILED TABLES

SURVEY OF GENERAL POPULATION: PUBLIC SUPPORT FOR MINNESOTA LIBRARIES TABLES

Table 19. Appendix B: Percent Distribution for Library Items

Library Items	Total
Some Household Use of Library	77.5%
	(668)*
Who in Household Uses the Library (derived)	
Both high usage (6+ times)	23.1%
No users in household	22.5%
Both Respondent and Others low usage	13.2%
Only Others in household use	13.2%
Respondent low, Others high usage	12.5%
Respondent only	9.7%
Respondent high, Others lower usage	5.8%
	100.0%
	(668)
Pattern of Support If Added Funding Needed (derived)	
Support taxes, Oppose fees and reduced service	24.3%
Support fees and reduced services, Oppose taxes	17.1%
Support fees, Oppose taxes and reduced services	12.7%
Support taxes and fees, Oppose reduced services	12.6%
Oppose taxes, fees and reduction in services	12.4%
Support reduced services, Oppose taxes and fees	10.3%
Support taxes and reduced services, Oppose fees	6.2%
Support taxes, fees and reduced services	4.4%
	100.0%
	(698)
Number of times Respondent Visited a Public Library In Person or Online in 2010	
None	38.3%
Once or twice	17.5%
3-5 times	14.0%
6-12 times	13.1%
13-20 times	4.6%
More than 20 times	12.6%
	100.0%
	(803)
Number of times Others in their Household Visited a Public Library in Person or Online in 2010	
None	32.2%
Once or twice	14.9%
3-5 times	11.3%
6-12 times	16.6%
13-20 times	8.1%
More than 20 times	16.9%
	8.1%
	100.0%
	(668)
Importance of Having a Public Library in Every Community	
Very important	68.9%

Library Items	Total
Somewhat important	23.7%
Not very important	5.4%
Not at all important	2.0%
	100.0%
	(802)
Should Public Library Support be Changed?	
Increase	
Stay the same	34.0%
Decrease	57.3%
	8.8%
	100.0%
	(688)
If Public Library Needed Additional Funds to Continue	
Operation, Do you support:	
Charging user fees	
Taxes to cover funds	47.3% (783)
Reducing services	46.8% (759)
	38.4% (752)
Library Regions	
Metropolitan (420)	52.2%
Great River (74)	9.2%
Southeastern (63)	7.9%
Arrowhead (56)	7.0%
Traverse Des Sioux (39)	4.9%
East Central (37)	4.6%
Pioneerland (27)	3.4%
Plum Creek (24)	2.9%
Kitchigami (22)	2.7%
Viking (20)	2.4%
Lake Agassiz (17)	2.1%
Northwest (5)	0.6%
	100.0%
	(804)
Library Regions (with smaller contiguous areas grouped)	
Metropolitan (420)	
Great River (74)	52.2%
Southeastern (63)	9.2%
Arrowhead, East Central (93)	7.9%
Plum Creek, Traverse Des Sioux, Pioneerland (90)	11.6%
Viking, Northwest, Kitchigami, Lake Agassiz (64)	11.2%
	8.0%
	100.0%
	(804)

* The number in parentheses is the total number of interviews upon which the percentage is based.

Table 20. Appendix B: Region of Residence

Region of Residence	Greater Minnesota	Twin Cities Area	sig*
Some Household Use of Library	71.7% (315)**	82.7% (352)	sig
Who in Household Uses the Library (derived)			
Both high usage (6+ times)	19.1%	26.6%	
No users in household	28.3	17.3	
Both Respondent and Others low usage	12.1	14.2	
Only Others in household use	15.0	11.6	sig
Respondent low, Others high usage	11.8	13.0	
Respondent only	8.0	11.3	
Respondent high, Others lower usage	5.7	5.9	
	100.0%	100.0%	
	(314)	(353)	
Pattern of Support If Added Funding Needed (derived)			
Support taxes, Oppose fees and reduced service	20.2%	28.0%	
Support fees and reduced services, Oppose taxes	16.6	17.7	
Support fees, Oppose taxes and reduced services	18.7	6.9	
Support taxes and fees, Oppose reduced services	13.9	11.4	sig
Oppose taxes, fees and reduction in services	12.5	12.5	
Support reduced services, Oppose taxes and fees	10.4	10.2	
Support taxes and reduced services, Oppose fees	5.0	7.2	
Support taxes, fees and reduced services	2.7	6.1	
	100.0%	100.0%	
	(337)	(361)	
Importance of Having a Public Library in Every Community			
Very important			
Somewhat important	64.6%	72.8%	
Not very important	26.3	21.2	
Not at all important	7.3	3.8	sig
	1.8	2.1	
	100.0%	100.0%	
	(384)	(419)	
Should Public Library Support be Changed?			
Increase	30.6%	37.0%	
Stay the same	59.4	55.2	ns
Decrease	10.0	7.8	
	100.0%	100.0%	
	(330)	(359)	
If Public Library Needed Additional Funds to Continue Operation, Do you support:			
Charging user fees	51.2% (375)	43.6% (408)	sig
Taxes to cover funds	41.5% (364)	51.6% (395)	sig
Reducing services	35.5% (363)	41.0% (388)	ns

* Chi square test of statistical significance is used. Sig means statistically significant at the .05 level and ns means not statistically significant at the .05 level.

Table 21. Appendix B: Gender

Gender	Men Respondents	Women Respondents	sig
Some Household Use of Library	75.4% (349)	79.7% (320)	ns
Who in Household Uses the Library (derived)			
Both high usage (6+ times)	18.3%	28.1%	
No users in household	24.6	20.3	
Both Respondent and Others low usage	10.9	15.6	
Only Others in household use	18.9	6.9	sig
Respondent low, Others high usage	17.2	7.5	
Respondent only	5.4	14.4	
Respondent high, Others lower usage	4.6	7.2	
	100.0% (349)	100.0% (320)	
Pattern of Support If Added Funding Needed (derived)			
Support taxes, Oppose fees and reduced service	18.3%	30.3%	
Support fees and reduced services, Oppose taxes	20.9	13.1	
Support fees, Oppose taxes and reduced services	14.6	10.9	
Support taxes and fees, Oppose reduced services	14.0	11.1	
Oppose taxes, fees and reduction in services	12.0	12.9	sig
Support reduced services, Oppose taxes and fees	8.9	11.7	
Support taxes and reduced services, Oppose fees	5.5	6.6	
Support taxes, fees and reduced services	5.4	3.4	
	100.0% (349)	100.0% (350)	
Importance of Having a Public Library in Every Community			
Very important			
Somewhat important	61.0%	76.6%	
Not very important	27.6	20.0	
Not at all important	8.4	2.5	sig
	3.0	1.0	
	100.0% (395)	100.0% (406)	
Should Public Library Support be Changed?			
Increase	31.2%	36.8%	
Stay the same	57.9	56.8	ns
Decrease	10.9	6.5	
	100.0% (349)	100.0% (340)	
If Public Library Needed Additional Funds to Continue Operation, Do you support:			
Charging user fees	55.9% (388)	38.7% (395)	sig
Taxes to cover funds	42.7% (377)	50.8% (382)	sig
Reducing services	41.6% (370)	35.2% (381)	ns

Table 22. Appendix B: Household Income

Annual Household Income	Less Than $30,000	$30,000 to $60,000	$60,000 to $90,000	$90,000 or more	sig
Some Household Use of Library	54.4% (79)	84.7% (157)	83.3% (132)	84.1% (164)	sig
Who in Household Uses the Library (derived)					
Both high usage (6+ times)	16.5%	26.6%	27.5%	22.6%	
No users in household	45.6	15.2	16.8	15.9	
Both Respondent and Others low usage	7.6	15.2	16.0	15.9	
Only Others in household use	7.6	18.4	11.5	12.2	sig
Respondent low, Others high usage	2.5	10.1	17.6	16.5	
Respondent only	12.7	8.2	6.9	11.0	
Respondent high, Others lower usage	7.6	6.3	3.8	6.1	
	100.0% (79)	100.0% (158)	100.0% (131)	100.0% (164)	
Pattern of Support If Added Funding Needed (derived)					
Support taxes, Oppose fees and reduced service	23.9%	28.1%	27.0%	29.4%	
Support fees and reduced services, Oppose taxes	12.0	15.0	13.5	23.5	
Support fees, Oppose taxes and reduced services	12.8	12.5	13.5	6.5	
Support taxes and fees, Oppose reduced services	12.8	16.9	15.1	6.5	sig
Oppose taxes, fees and reduction in services	15.4	11.9	8.7	9.8	
Support reduced services, Oppose taxes and fees	15.4	7.5	4.0	11.8	
Support taxes and reduced services Oppose fees	1.7	5.6	11.1	8.5	
Support taxes, fees and reduced services	6.0	2.5	7.1	3.9	
	100.0% (117)	100.0% (160)	100.0% (126)	100.0% (153)	
Importance of Having a Public Library in Every Community					
Very important	74.8%	71.2%	72.5%	69.0%	
Somewhat important	18.5	24.5	20.4	21.4	ns
Not very important	3.7	3.3	5.6	6.5	
Not at all important	3.0	1.1	1.4	3.0	
	100.0% (135)	100.0% (184)	100.0% (142)	100.0% (168)	
Should Public Library Support be Changed?					
Increase	37.4%	39.0%	40.0%	31.0%	
Stay the same	57.4	56.0	54.6	57.9	ns
Decrease	5.2	5.0	5.4	11.0	
	100.0% (115)	100.0% (159)	100.0% (130)	100.0% (145)	
If Public Library Needed Additional Funds to Continue Operation, Do you support:					
Charging user fees	45.0%	46.9% (179)	51.8% (139)	41.3% (167)	ns

Taxes to cover funds	(131)	51.1% (174)	57.4% (136)	49.1% (163)	ns
Reducing services	45.4% (130)	32.8% (174)	37.0% (135)	47.5% (158)	sig
	35.2% (122)				

Table 23. Appendix B: Use of Library

Item	No Household Use	Some Household Use	sig
Who in Household Uses the Library (derived)			
Both high usage (6+ times)		29.8%	
No users in household	100.0%		
Both Respondent and Others low usage		17.0	
Only Others in household use		17.0	
Respondent low, Others high usage		16.1	sig
Respondent only		12.6	
Respondent high, Others lower usage		7.5	
	100.0% (150)	100.0% (517)	
Pattern of Support If Added Funding Needed (derived)			
Support taxes, Oppose fees and reduced service	10.9%	27.7%	
Support fees and reduced services, Oppose taxes	32.6	13.7	
Support fees, Oppose taxes and reduced services	17.8	10.5	
Support taxes and fees, Oppose reduced services	7.8	14.6	sig
Oppose taxes, fees and reduction in services	13.2	11.3	
Support reduced services, Oppose taxes and fees	9.3	10.9	
Support taxes and reduced services, Oppose fees	3.1	7.6	
Support taxes, fees and reduced services	5.4	3.7	
	100.0% (129)	100.0% (459)	
Importance of Having a Public Library in Every Community			
Very important	55.0%	71.8%	
Somewhat important	27.8	22.8	sig
Not very important	10.6	4.8	
Not at all important	6.6	0.6	
	100.0% (151)	100.0% (517)	
Should Public Library Support be Changed?			
Increase	13.2%	38.5%	
Stay the same	66.7	54.6	sig
Decrease	20.2	6.9	
	100.0% (129)	100.0% (452)	
If Public Library Needed Additional Funds to Continue Operation, Do you support:			
Charging user fees	61.3% *(150)*	43.7% *(503)*	sig

Taxes to cover funds	28.6% *(140)*	52.2% *(492)*	sig
Reducing services	49.6% *(137)*	36.4% *(492)*	sig

Table 24. Appendix B: Education

Respondent's Education	Some college or less	Graduate of college	Post grad education	sig
Some Household Use of Library	62.0% (221)	83.4% (326)	92.2% (115)	sig
Who in Household Uses the Library (derived)				
Both high usage (6+ times)	11.7%	27.0%	35.3%	
No users in household	37.8	16.6	7.8	
Both Respondent and Others low usage	11.7	13.5	15.5	
Only Others in household use	19.4	11.3	7.8	sig
Respondent low, Others high usage	7.7	14.1	18.1	
Respondent only	6.8	11.3	9.5	
Respondent high, Others lower usage	5.0	6.1	6.0	
	100.0% (222)	100.0% (326)	100.0% (116)	
Pattern of Support If Added Funding Needed (derived)				
Support taxes, Oppose fees and reduced service	15.0%	25.7%	40.5%	
Support fees and reduced services, Oppose taxes	18.8	18.2	10.3	
Support fees, Oppose taxes and reduced services	17.5	11.3	6.9	
Support taxes and fees, Oppose reduced services	12.9	12.8	12.9	sig
Oppose taxes, fees and reduction in services	14.6	12.2	7.8	
Support reduced services, Oppose taxes and fees	13.8	9.3	6.0	
Support taxes and reduced services Oppose fees	2.1	7.5	11.2	
Support taxes, fees and reduced services	5.4	3.0	4.3	
	100.0% (240)	100.0% (335)	100.0% (116)	
Importance of Having a Public Library in Every Community				
Very important				
Somewhat important	64.8%	67.5%	80.9%	
Not very important	26.4	24.6	15.3	ns
Not at all important	6.7	5.6	3.1	
	2.1	2.4	0.8	
	100.0% (284)	100.0% (378)	100.0% (131)	

Should Public Library Support be Changed?				
Increase	26.4%	32.7%	54.4%	
Stay the same	64.6	57.6	39.5	sig
Decrease	8.9	9.7	6.1	
	100.0% (246)	100.0% (321)	100.0% (114)	
If Public Library Needed Additional Funds to Continue Operation, Do you support:				
Charging user fees	54.9% (275)	45.4% (372)	35.2% (128)	sig
Taxes to cover funds	35.7% (272)	48.2% (355)	67.7% (124)	sig
Reducing services	41.6% (257)	38.4% (362)	31.5% (124)	ns

Table 25. Appendix B: Age

Respondent's Age (Birth cohort)	18-34 (1976-1992)	35-54 (1956-1975)	55 and older (before 1956)	sig
Some Household Use of Library	87.9% (66)	84.3% (268)	70.3% (316)	sig
Who in Household Uses the Library (derived)				
Both high usage (6+ times)	21.2%	29.2%	19.0%	
No users in household	12.1	15.7	29.8	
Both Respondent and Others low usage	27.3	11.2	12.1	
Only Others in household use	12.1	17.2	10.5	sig
Respondent low, Others high usage	10.6	15.4	10.5	
Respondent only	4.5	6.0	12.5	
Respondent high, Others lower usage	12.1	5.2	5.4	
	100.0% (66)	100.0% (267)	100.0% (315)	
Pattern of Support If Added Funding Needed (derived)				
Support taxes, Oppose fees and reduced service	29.7%	23.8%	24.6%	
Support fees and reduced services, Oppose taxes	9.4	20.4	15.7	
Support fees, Oppose taxes and reduced services	14.1	11.7	12.0	
Support taxes and fees, Oppose reduced services	14.1	10.6	14.6	ns
Oppose taxes, fees and reduction in services	14.6	12.2	7.8	
Support reduced services, Oppose taxes and fees	3.1	13.6	9.1	
Support taxes and reduced services, Oppose fees	7.8	5.3	6.9	
Support taxes, fees and reduced services	6.3	2.3	5.4	
	100.0% (64)	100.0% (265)	100.0% (350)	
Importance of Having a Public Library in Every Community				
Very important	71.0%	66.7%	70.6%	

Somewhat important	26.1	23.5	22.7	ns
Not very important	1.4	7.1	5.1	
Not at all important	1.4	2.7	1.7	
	100.0%	100.0%	100.0%	
	(69)	(294)	(415)	
Should Public Library Support be Changed?				
Increase	41.9%	30.0%	36.2%	
Stay the same	54.8	59.2	56.5	ns
Decrease	3.2	10.8	7.3	
	100.0%	100.0%	100.0%	
	(62)	(250)	(354)	
If Public Library Needed Additional Funds to Continue Operation, Do you support:				
Charging user fees	44.9% (69)	44.9% (287)	48.5% (404)	ns
Taxes to cover funds	59.1% (66)	41.6% (281)	49.9% (389)	sig
Reducing services	25.8% (66)	42.1% (280)	37.9% (383)	sig

Table 26. Appendix B: Library Region

Library Regions (Grouped)	Metro-politan	Great River	South-eastern	Arrowhead, East Central	Plum Creek, Traverse, Pioneerland	Viking, NW, Kitchigami, Lake Agassiz	sig
Some Household Use of Library	82.7% (352)	75.0% (64)	77.5% (40)	66.2% (77)	73.5% (83)	68.6% (51)	sig
Who in Household Uses the Library (derived)							
Both high usage (6+ times)	26.6	18.8	15.0	11.5	19.5	34.0	
No users in household	17.3	25.0	22.5	33.3	26.8	32.0	
Both Respondent and Others low usage	14.2	14.1	10.0	15.4	11.0	8.0	
Only Others in household use	11.6	14.1	27.5	16.7	13.4	6.0	sig
Respondent low, Others high usage	13.0	14.1	15.0	7.7	15.9	6.0	
Respondent only	11.3	7.8	10.0	7.7	7.3	8.0	
Respondent high, Others lower usage	5.9	6.3	0.0	7.7	6.1	6.0	
	100.0% (353)	100.0% (64)	100.0% (40)	100.0% (78)	100.0% (82)	100.0% (50)	
Pattern of Support If Added Funding Needed (derived)							
Support taxes, Oppose fees and reduced service	28.0%	22.0%	14.5%	16.1%	27.5%	19.6%	
Support fees and reduced services, Oppose taxes	17.7	23.7	21.8	13.8	16.3	8.9	
Support fees, Oppose taxes and reduced services	6.9	27.1	12.7	21.8	11.3	25.0	
Support taxes and fees, Oppose reduced services	11.4	8.5	18.2	14.9	16.3	10.7	sig
Oppose taxes, fees and reduction in services	12.5	5.1	10.9	10.3	12.5	26.8	
Support reduced services, Oppose taxes and fees	10.2	11.9	10.9	12.6	8.8	5.4	
Support taxes and reduced services Oppose fees	7.2	1.7	5.5	10.3	3.8	1.8	
Support taxes, fees and reduced services	6.1	0.0	5.5	0.0	3.8	1.8	
	100.0% (361)	100.0% (59)	100.0% (550)	100.0% (87)	100.0% (80)	100.0% (560)	
Importance of Having a Public Library in Every Community							
Very important	72.8%	52.7%	68.3%	68.8%	63.3%	72.6%	
Somewhat important	21.2	36.5	22.2	19.4	30.0	24.2	ns
Not very important	3.8	8.1	7.9	8.6	6.7	3.2	
Not at all important	2.1	2.7	1.6	3.2	0.0	0.0	
	100.0% (419)	100.0% (74)	100.0% (63)	100.0% (93)	100.0% (90)	100.0% (62)	
Should Public Library Support be Changed?							
Increase	37.0%	24.2%	36.4%	30.9%	32.5%	29.4%	
Stay the same	55.2	59.1	50.9	60.5	62.3	64.7	ns
Decrease	7.8	16.7	12.7	8.6	5.2	5.9	
	100.0% (359)	100.0% (66)	100.0% (55)	100.0% (81)	100.0% (77)	100.0% (51)	

If Public Library Needed Additional Funds to Continue Operation, Do you support:							
Charging user fees	43.6% (408)	57.1% (70)	59.7% (62)	51.6% (93)	45.6% (90)	43.5% (62)	ns
Taxes to cover funds	51.6% (395)	30.4% (69)	45.6% (57)	40.2% (92)	52.3% (86)	35.6% (59)	sig
Reducing services	41.0% (388)	39.1% (69)	46.8% (62)	38.2% (89)	33.3% (84)	20.3% (59)	sig

APPENDIX C: CONTINGENT VALUATION SURVEY DETAILS AND QUESTIONNAIRE

In contrast to a cost-based approach in which the value of library services is inventoried and summed, we survey library users about the value of bundled library services using willingness-to-pay (WTP) as a proxy in measuring value. The estimated range of total donation for library services in Minnesota is found by multiplying our mean interval by the estimated 2,061,882 households in Minnesota (US Census, 2009). The total donation interval is [$65.4 million, $79.0 million].

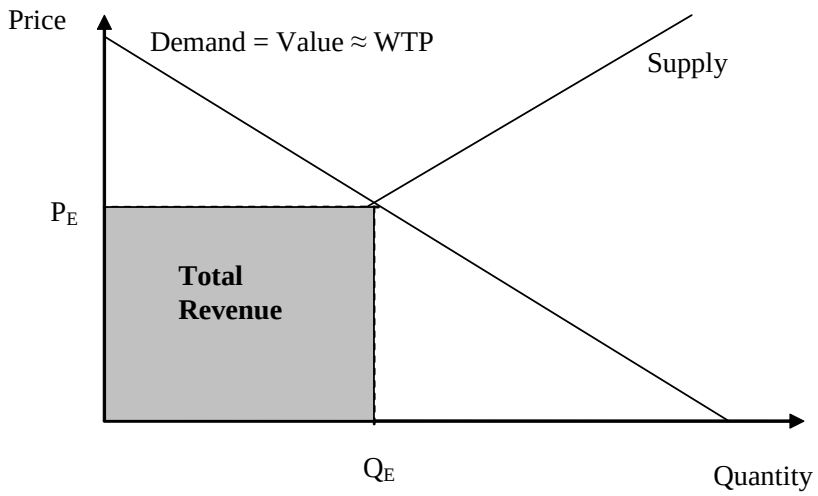
Note: The tables and figures of this appendix are not indexed at the front of the document.

WILLINGNESS TO PAY METHODOLOGY

Markets allocate goods and services based on the relationship between value and price. Rational households are expected to purchase the good or service if their value exceeds the price they must pay for it. Value can be subjective such that there must be a way to estimate it (as opposed to knowing the true amount); in markets, value is based on willingness and ability to pay (WTP), since households must be both willing and able to pay a supplier's price to receive the good or service . Therefore, WTP is typically used as a proxy in measuring value.

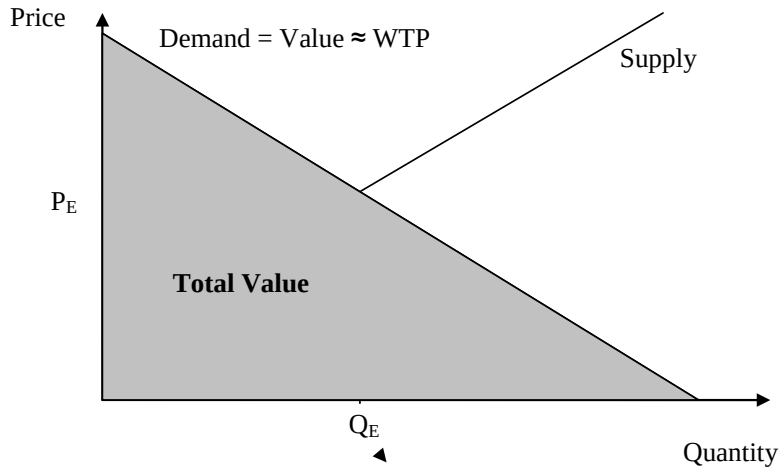
Figures 1 and 2 demonstrate this principle. Figure 1 illustrates how much revenue would be expected to be made (at equilibrium) on sales of the good or service in this competitive market, based on simply multiplying the expected price P_E by the expected quantity Q_E. This market information is often collected (or could be estimated) with relatively ease.

Figure 1: Total Revenue from Expected Transactions



However, total revenue is not total value. Figure 1 illustrates that households with high demand may have a WTP value much above the equilibrium price. If these households made a purchase at the equilibrium price, they would be getting a "good deal" because their WTP is much greater than the price they paid. Other households may have a WTP value below the equilibrium price. Therefore, while these households do value the good or service, they are not contributing to total revenue. Figure 2 demonstrates how to estimate the total value in this market. It is given by the area under the demand curve. This figure represents the total amount households would be willing to pay for the given good or service in this market. Therefore, in order to properly determine value (or "worth"), the demand function should be estimated rather than revenue or supply (as in "cost-based" approaches).

Figure 2: Total Value of the Good or Service



The goal of this part of the study was to estimate the total value of MN public library services, which can then be used in the greater study to contribute to the estimate the return on investment.[13] While economists have developed several valuation estimation techniques, none are perfect. Herein, the most direct way of valuing public library services was utilized. A survey was developed to ascertain a proxy of households' WTP. This approach is referred to as the Contingent Valuation Method (CVM). Proxy values were combined and statistical techniques were used to estimate the total value of MN public library services.

Background

The CVM approach has become a standard approach in valuing non-private goods and services typically provided by government (see for example, Mitchell and Carson, 1989). The method relies on direct valuation, asking survey respondents to state their WTP for a small hypothetical increase in the amount of non-private

[13] Note that the goal is not to estimate the efficient level of each public library service, which would require estimation of the demand and supply curves for each service in order to determine where marginal value equaled marginal costs.

good or service offered. Because of its hypothetical nature and other concerns with the CVM, a group of economists (a.k.a. "NOAA panel"), offered recommendations regarding how to properly implement a CVM such that the results could be considered reliable (Arrow et al., 1993). The panel's recommendations have been generally accepted, but some of their recommendations can be difficult or impractical to implement, depending on the application. While the CVM for the Minnesota Libraries' ROI study herein follows many of these suggestions, there are also a few diversions which are considered below.

The NOAA panel suggests that the CVM be framed in the context of a referendum (Arrow et al., 1993). This is usually accomplished by asking respondents whether they would be willing to pay a given amount in extra taxes to pay for a small change in the good or service. For example, related to environmental studies, consider the hypothetical scenario where Minnesota residents could pay for additional resources to be devoted to slow aquatic invasive species spread. The referendum question may be framed in this manner: Is your household WTP $50 extra annually in property tax to pay for a boat examiner to work at your local lakes and rivers? Note that the mechanism is simple, $50 goes to local government to purchase the labor of an examiner. It is unlikely that any significant proportion of the household's current property tax bill goes to examination services. Therefore, the household knows the baseline (currently paying $0 for these services) as well as the exact amount of change in payment ($50) suggested to get the change in good or service (one examiner).

However, a similar referendum on support for public library services is not so easily framed. Public library services are typically paid for using property taxes, which are lumped together with many other goods and services not related to the libraries, and combined into one bill. Few survey respondents are likely to know the exact amount of current property taxes devoted to their public libraries they are paying, which muddies the baseline comparison. If the question is framed as approve/disapprove an additional $50, and again, no one knows how much is currently being paid, so the decision becomes more complicated. Theory predicts that the extra value will decline as addition amounts of service are offered. Another complication is manifest in the fact that local tax amounts and rates differ significantly in Minnesota. A survey respondent would be forced to know or obtain detailed information about their current property taxes, which is clearly impractical. Therefore, for the valuation of Minnesota public libraries, respondents were not asked to consider any amount they are indirectly contributing to libraries through property taxes. Rather than ask respondents to deduct all current indirect taxes and to then consider a new tax amount, the WTP question was framed as a voluntary donation. It is assumed that many respondents will already have had experience with voluntary donations to services (such as donations offered at religious institutions, or contributions to the Public Broadcasting Service).

The voluntary donation mechanism is criticized by the NOAA panel for creating incentive compatibility problems for certain types of goods and services (Arrow et al., 1993). For example, imagine you value services that others can use and their use does not significantly diminish your value (e.g., visiting your favorite state park). If you think a sufficient number of others will pay for an improvement in the service provided, you might choose to not pay in order to get better services without contributing. (This is known as the "free-rider" problem). The panel thought that the voluntary donation mechanism was likely to increase the amount of free riding, compared to other mechanisms, and thus underestimate the true total value of these goods and

services (Ledyard 1995; Rondeau, Schulze, and Poe, 1999). However, empirical work by Haskell et al. (2010) contradicts these results; they show that the voluntary donation mechanism obtains the highest values. Their results suggest that a simple, familiar, and fair mechanism is most appropriate for true value elicitation.

The library offers many goods and services, and to compute ROI states often attempt to value each book, internet access, or program, etc., in the state system. However, our survey resources would have been greatly over-extended by this approach. Instead, respondents are asked to value the total bundle of goods and services offered by their public library. Although the CVM approach is not perfect, this approach does not seem unreasonable, given that many such decisions are made by the typical household on an annual basis. (Consider annual giving for bundled religious services, or annual memberships for bundled services at places such as the zoo, aquarium, museum, and etc.).

We recognize that using a voluntary donation mechanism to value a bundle of services could create legitimate concern about the validity of the study. However, the benefits and costs of these choices must be considered. For this application the preferred criteria of simple and familiar seem highly defensible. We continue by providing greater detail on the methodology of the WTP questions.

WTP Methodology

Economists have long recognized the troublesome problem of asking households to provide accurate answers to difficult WTP questions (Arrow et al., 1993). The simplest approach for the survey researcher can be the most burdensome for those surveyed. For example, one could format a WTP question as follows: How much is your household WTP annually for the goods and services provided by the library to the public? The respondent would be asked to fill in an amount to complete the question. The problem arises from the nature of estimating demand with WTP itself; the economist wants to know what the household is willing and able to pay for the good and service. Economic theory requires the household to consider its income and think of the possible ways it could be spent, with the goal of achieving the highest level of satisfaction from that limited resource. It is also evident that surveys are often completed very rapidly, and those surveyed are unlikely to have enough time to consider alternatives (a.k.a. opportunity costs).

In response to this problem a preferred approach is to ask the respondent to provide a “yes” or “no” answer to a specific value (a.k.a. dichotomous choice): Would your household be willing and able to pay $20 for the goods and services provided by the library to the public? This type of decision is thought to be much less burdensome since the respondent does not need to know the library's precise value, but rather only whether or not it is above/equal or below the listed amount. With all such decisions there are benefits and costs; the major cost is that the economist does not receive the actual value needed. This leads to more complicated surveying techniques and statistical analysis.

In an attempt to get closer to households’ true value [of the libraries], a method referred to as double-bounded CVM was created by asking a follow-up WTP question which depends on the answer to the first. If the respondent answers “yes,” a new question with a higher WTP is presented, and vice versa for a "no"

answer. Several studies have found this advantageous in increasing statistical efficiency (see the seminal study by Hanemann, Loomis, and Kanninen, 1991), although questions remain about whether multiple WTP questions tend to create biases capable of influencing results (see for example McFadden, 1994; Ariely, Loewenstein, and Prelec, 2003; and Loomis, 2010).

Bjornstad, Cummings, and Osborne (1997) introduced a learning design for CVM where respondents face repetitive real and hypothetical choices, and their results suggest decreased hypothetical bias. More recently, a similar learning-based concept was employed by Bateman et al. (2008), which tests if learning could reduce some of the biases previously found in double-bounded CVM. Specifically, they find evidence of institutional and value-based learning while asking respondents four WTP questions. Institutional learning can occur as a respondent becomes familiar with receiving a follow-up question, as opposed to being caught off guard and perhaps responding in opposition to their true value, due to confusion. Consider someone new to a live auction; because they may be nervous or unsure about the rules, they focus on the rules rather than on the valued good or service being sold. Value based learning suggests that after receiving practice at valuing a type of goods and services, the respondent might be able to better value similar types of goods and services, and hone in on their true value as opposed to answering the WTP questions randomly because of the complexity of the task. Another benefit of valuing similar goods and services is to provide the respondent with alternative donation possibilities (a.k.a. substitutes) to assist the respondent in considering how best to spend their income to maximize satisfaction. Providing substitutes was encouraged by the NOAA panel (Arrow et al., 1993), and more recently, for example, by Morse-Jones et al. (2010). While the possible bias versus efficiency gain of the double bounded format is an unresolved question in the literature, in the library valuation survey and analysis we employ this promising learning design approach as a best known practice.

The goal was to allow continued value learning opportunities, given the complexity of the WTP question outlined above. In our survey instrument designed for gathering value data, the first question asks the respondent to consider a voluntary donation to the Public Broadcasting Service (PBS). This was chosen because of its familiarity and its commonalities with valuing bundled library services. (PBS offers many bundled services between television programming and online opportunities.) Respondents had the opportunity to learn about the institution (will receive a follow-up WTP question) and valuing bundled goods or services. The second question allowed for further institutional learning while introducing respondents to the concept of ignoring current indirect payments in their value estimation. Respondents were asked to imagine that local city park services were not supplied by tax dollars but would require donations to be continued. The WTP question asked respondents whether or not they would be willing to donate to continue these services. The ordering of these questions is intentional, as the complexity of the payment scenarios increase.

It is important to note that many households might not in fact use the services provided by PBS or city parks. This is also true of the public library. It does not disallow non users from valuing these services; the significance of non use values has long been recognized by environmental economists (see Krutilla, 1967).

To determine the amounts to fill into the dichotomous choice WTP questions a pretest was designed with open-ended WTP questions in accordance with Boyle and Bishop (1988). The pretest was administered at three public libraries locations including one in the Twin Cities, one in Duluth, and one on the Iron Range. The total number of usable surveys was 114. These were weighted according to statewide income classification. These bids were arrayed for each of the three questions and were chosen based on advice from Hanemann and Kanninen (1991, p. 64): "…that follow-up bids should not be so high or so low that all observations are bounded." Given the similarity of the goods in the three WTP questions, a strong secondary consideration was to purposefully try to avoid the same values being repeated, in an attempt to avoid respondents becoming influenced by the values offered, a.k.a. "anchoring" (see for example Kahneman , Slovic, and Tversky, 1982 for further discussion on such biases). Additionally, Professor John Loomis (a CVM expert at the University of Colorado) indicated in a recent conversation that some recent results (Loomis, 2010) pointed to a problem associated with the often used methodology of either halving the first WTP value (if respondents answer "no") or doubling the first WTP value (if respondents answer "yes"). Their research suggested that doubling the amount for a "yes" vote may be creating problems, suggesting that the increase should perhaps not be as drastic. This knowledge was incorporated into our valuation survey instrument: Values for the follow-up questions were increased (for "yes") or decreased (for "no) by the same magnitude change from the first to halving the low follow-up bid. (For example, if the first value was $100, the follow-ups would be set at $50 for low and $150 for high rather than $200 for high). The final number of survey versions was 16; representing a complete design for two initial values for PBS, two initial values for city parks, and four initial values for library questions. The versions and values are presented in Table 1.

Table 1: Survey Version, Description, and Values

#	*Description*	*PBS WTP1*	*PBS WTP2*	*City Park WTP1*	*City Park WTP2*	*Library WTP1*	*Library WTP2*
1	$P_LC_LL_{VL}$	20	10	40	20	20	10
			30		60		30
2	$P_LC_LL_L$	20	10	40	20	50	25
			30		60		75
3	$P_LC_LL_H$	20	10	40	20	10	50
			30		60		15
4	$P_LC_LL_{VH}$	20	10	40	20	20	10
			30		60		30
5	$P_LC_HL_{VL}$	20	10	70	35	20	10
			30		10		30
6	$P_LC_HL_L$	20	10	70	35	50	25
			30		10		75
7	$P_LC_HL_H$	20	10	70	35	10	50
			30		10		15
8	$P_LC_HL_{VH}$	20	10	70	35	20	10
			30		10		30
9	$P_HC_LL_{VL}$	80	40	40	20	20	10
			12		60		30

10	$P_HC_LL_L$	80	40	40	20	50	25
			12		60		75
11	$P_HC_LL_H$	80	40	40	20	10	50
			12		60		15
12	$P_HC_LL_{VH}$	80	40	40	20	20	10
			12		60		30
13	$P_HC_HL_{VL}$	80	40	70	35	20	10
			12		10		30
14	$P_HC_HL_L$	80	40	70	35	50	25
			12		10		75
15	$P_HC_HL_H$	80	40	70	35	10	50
			12		10		15
16	$P_HC_HL_{VH}$	80	40	70	35	20	10
			12		10		30

Survey Design

After an introductory script, respondents were asked to consider the services provided by PBS to all who have access, and if they would be willing to make a donation of a given value. Specifically, the WTP script was: "Keeping in mind your household's current income, would you be willing and able to donate $XX dollars per year for PBS to continue all of its services?" They would then receive the follow-up question: "Would you be willing and able to donate $YY dollars per year for PBS to continue all of its services?" They were then asked to consider services offered by local city parks. Recall one of the learning goals was to familiarize respondents to not consider taxes with the following text: "Imagine that the city had to collect donations rather than receiving tax dollars to keep all these park services available. What if YOU were contacted to make a donation?" Similar WTP script followed.

Next, respondent were asked to consider public library services. They were provided a list of the predetermined most popular services and asked whether anyone in their household had used those within the past year ("yes"/"no" answers). This script accomplishes two goals; it informs or refreshes respondents about the many available services that will be bundled and also provides a significant intentional time break from the previous valuation exercises which lessens the probability of anchoring effects. The survey continued with the public library valuation questions using script similar to the city parks provided above.

Conditional questions followed to assist in separating protest bidders and hypothetical bias. If a respondent answered "no" to both library valuation questions they were asked to list why. Five common answers were provided for "yes" or "no" responses and other reasons (open ended) were allowed. If respondents answered "yes" to at least one library valuation question they were asked to assess the likelihood they would pay the agreed amount if contacted today to collect: the scripted options were "very likely," "somewhat likely," "not very likely," and "not at all likely."

Demographics for the valuation survey overlapped with data from a previous state survey sampling; therefore, the valuation survey was relatively short. The final two questions were used to ensure matching with the state survey. Year of birth and gender were the variables that allowed for concatenation.

Data Collection

The Minnesota Center for Survey Research (MCSR) facilitated the data collection by drawing statewide from the 804 household sample used in the 2010 Minnesota State Survey. These households were phoned between March 8th and April 7th, 2011. A total of 557 surveys were completed (equally distributed between the 16 versions in Table 1) for an overall response rate of 74% (deducting invalid numbers).

Using the 2010 Minnesota State Survey sample provided several key benefits. First, having a recent sample of known working numbers and willing participants saved time and money and allowed for a high response rate. Second, the state survey asked several questions about library use, the importance of libraries, and how changes in library services should be funded. Therefore, our respondents had considered many important aspects of libraries within six months of completing the valuation survey.[14] This helped ensure familiarity of the good or service, which is a key component in obtaining reliable estimates from CVM surveys (Arrow, 1993). Finally, the state survey asked many demographic questions which did not then have to be repeated in the valuation survey.

The completed surveys then needed to be reviewed before statistical analysis could begin. As is typical in CVM, many surveys were eliminated. Some respondents do not trust how the surveys will be used, or the library to spend money wisely; these are referred to as protest bidders and are typically eliminated since they may value library services but allow other considerations to determine their decisions. Other respondents either volunteered that they did not understand the questions or it was determined they did not.[15] A total of 68 observations were removed for these two reasons. In addition, some respondents indicated that their households would pay, however when asked "if contacted today, the likelihood they would pay..." answered “Not very likely” or “Not at all likely.” This is an indication of hypothetical bias, saying “yes” because it is hypothetical, and because it will not actually be collected. Thirty-nine more observations were removed for this reason. Also, 21 respondents either refused to answer one or more WTP questions or volunteered an answer of “don’t know.” Finally, two respondents were removed because they were either not the same respondent in the state survey, or they were confused based on overlapping demographic questions between the two surveys. The final sample for statistical analysis included 429 observations.

[14] Note that year of birth and gender where used to verify the same respondent for both surveys.

[15] This was accomplished by responses to open ended questions; a typical answer might be “We’re not willing to pay because we pay for it using taxes” when the WTP (willingness-to-pay) question asked them to *not* consider taxes when determining their donation.

Statistical Analysis

As described in the introduction and methodology sections, the goal is to estimate value for library services by statistical methods. Upfront this can be as simple as estimating a standard theoretical demand function such as Q = f(P, others), where quantity demanded is a function of the price of the good or service, and "others" are the usual suspected variables that can influence demand—such as prices of substitute goods and services, number of buyers, tastes and preferences, etc. Recall, however, that these data collected are the result of respondents providing "yes" or "no" answers to a two-WTP value, as opposed to asking them to directly value library services. Therefore, we either know an upper limit on their value (if answer "no" to both), a range of their value (if "yes"/"no" or "no"/"yes"), or a lower limit on their value (if "yes" to both). Table 2 describes the implied values based on these criteria.

Table 2: Implied Values from the Survey Responses

Value	*n*	*%*
Less than $10	28	7%
Less than $25	48	11%
Less than $50	67	16%
Less than $100	81	19%
$10-$20	5	1%
$20-$30	33	8%
$25-$50	25	6%
$50-$75	20	5%
$50-$100	13	3%
$100-$150	11	3%
$100-$200	19	4%
$200-$300	5	1%
Over $30	42	10%
Over $75	18	4%
Over $150	7	2%
Over $300	7	2%
Total	429	100%
n = number of observations		

For this analysis, library goods and services are being bundled such that each household is essentially voting to purchase the bundle at the given price or not. Therefore, quantity is being measure by a "yes" (coded numerically as 1) or "no" (coded as 0). This is known as a dichotomous qualitative dependent variable. The predicted value of quantity can be interpreted as a probability of purchase, in which case these values should be restricted between 0 and 1 (see for example, Kennedy, 2001). Two typical statistical models that satisfy this requirement are the logit and probit models, which differ based on the assumed cumulative function being either logistic or normal (Kennedy, 2001). In addition, statistical models have been developed to include the response to the follow-up WTP question in the estimation (double bounded interval logit and bivariate probit). These are the base models that were considered in the statistical analysis.

In the library valuation data, there were many possibilities for independent variable inclusion and splitting the sample. As the estimation goal is to determine the value from a demand function (quantity is the dependent variable), variables that approximate quantity demanded should not be used as independent variables (note the endogeneity problem; see for example, McConnell, 1990). However, if users and non-users of the library significantly differed in how they valued these services, the sample could be split to obtain better estimates. Library service use data were collected from both our survey of the general Minnesota population and the valuation survey, which allowed for a consistency check. In the statistical sample, 43 observations (over 10%) were determined to be strongly inconsistent, and many more were at least somewhat inconsistent. This was troubling, as it made criteria for separating the sample based on usage quite complicated. In addition, weighting the valuation observations to match Minnesota population usage would have been suspect because the source of this data would have been the state sample.

A second option was to split the sample by income groups. While income dummies and interaction terms can be used in regression models, it is possible that separate models can perform better. Typical with CVM, many respondents choose to not answer household income questions, despite providing ranges which makes it impossible to isolate exact income amounts. It is often misunderstood how important this information is in economic studies, which often need to be aggregated on order to match populations. About 18% of respondents avoided the income question and were categorized separately. Initial results indicated that income was statistically significant and that some income groupings could be isolated. Several types of income splits were tested: one without separation, one model with a separate regression for household income under $30,000, and the rest, lumped. (These lumped income splits are referred to as "Split" in tables and figures), and include one with a separate regression for income under $30,000 and a second regression utilizing dummy variables categorizing household income as, $30-$50K, $50-$100K, $100K and more, and missing income (which is referred to as "Multi Split" in tables and figures).[16]

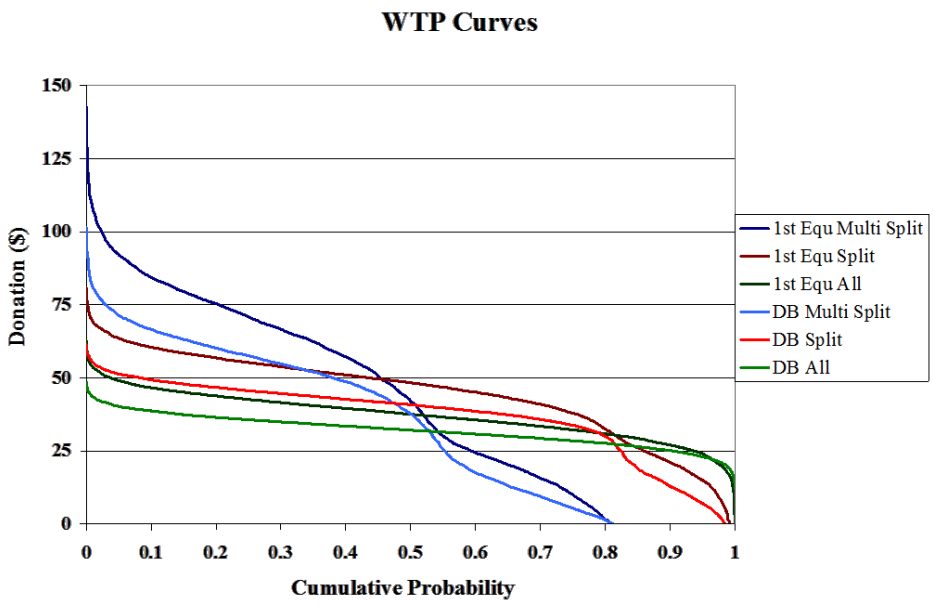
Many other independent variables were considered. Two regional specifications were tried; one separating the Twin Cities metro area from all other observations, and a second based on Minnesota Census regions. Neither was significant in the models, allowing for statewide application of the final results. Other demographics including race, gender, age, and number of kids at home, were insignificant. Education categorical variables yielded mixed results in terms of statistical significance, yet did little to change the performance of the models; therefore they were excluded.

[16] Missing income is statistically significant in the second grouping which allows for more accurate accounting of the group's effects.

Two types of logit models were considered for each of the three income breakdowns outlined above.[17] First, a single bounded model of the first response to the first bid (referred to as "1st Equ" in tables and figures). Second, a double bounded interval logit model, capable of utilizing the responses to both bids (referred to as "DB" in tables and figures). The results can be readily manipulated to find the mean WTP (see for example, Hanemann, Loomis, and Kanninen, 1991).

Using the Krinsky and Robb (1986) procedure, 5,000 draws from the estimated distributions were recorded. For those models separating income groups, the number of draws for each group was based on our sample result of 18% missing with the rest distributed according to the household income census breakdowns of Minnesota (US Census, 2009). These draws can be thought of as WTP of individual households for the bundled library services. After being arrayed, WTP curves (a.k.a. demand curves) can be created. The results are shown in Figure 3. There are clearly model differences of WTP at the median (50th percentile).

Figure 3: WTP Curves of 5,000 Draws from each Model



One method for determining the accuracy of the model in predicting purchase is to use prediction tables; the statistical estimation predicts "yes"/"no" for each respondent, and those predictions are compared to their actual choices. However, single bounded and double bounded models cannot be directly compared since it is

[17] Probit model results on the first response were very similar to those of the comparable logit model. The bivariate probit model yielded unreliable results compared to the actual data.

more complicated to correctly predict two answers than one. Table 3 presents the prediction table results. Using only the first response, the single income split model leads to the lowest percentage of correct predictions. For the double bound models the procedure suggested by Kanninen and Khawaja (1995) is used to provide an appropriate comparison. The results are intuitive in that the higher percentage of fully correct classified cases (FCCC) indicates better model prediction. Therefore, the model with multiple income splits is the lowest performing by this criterion. As a way of narrowing the results, the model with the lowest percentage was dropped from each category.

The Krinsky and Robb (1986) procedure was then repeated 500 times (with 5,000 draws for each WTP curve) and the mean and median of each repetition was recorded to account for variance within the remaining models. The 500 means and medians of each model were arrayed and the 95% confidence intervals were found by dropping the lowest and highest 2.5%. The results are presented in Table 4. If one considers the WTP curves of Figure 3 ,it is not surprising that there is little variance in three of the four remaining models because the curves are quite flat in the middle of the WTP distributions. Greater variance occurred in the multiple split model; however by creating the confidence interval many of the more extreme mean/median values were excluded.

Table 3: Prediction Tables for the Models presented in Figure 3

Logit Model	*Correct*	*Correct %*	
1st Equ Multi Split	324	75.5	
1st Equ Split	314	73.2	
1st Equ All	330	76.9	
Double Bound Logit Model	*ICCC*	*FCCC*	*FCCC%*
DB Multi Split	320	221	51.5
DB Split	325	234	54.5
DB All	330	240	55.9
ICCC = Initially Correct Classified Cases			
FCCC = Fully Correct Classified Cases			

At this point, there are many possible ways to proceed. The prediction tables indicate that the remaining models by category lead to similar prediction success. Additionally, there are no clear ways to compare across model categories. Therefore, it is suggested that the confidence intervals be combined by taking the extremes of the lower and upper bounds to create a final interval for the mean and median.

Table 4: 95% Confidence Intervals of the Mean and Median from 500 WTP Curves

	Mean	Median
1st Equ All	[$37.1, $37.5]	[$37.6, $38.0]
1st Equ MS	[$37.4, $38.3]	[$40.7, $42.8]
DB All	[$31.7, $32.0]	[$31.8, $32.1]
DB Split	[$36.4, $36.7]	[$40.4, $40.8]
Final Interval	**[$31.7, $38.3]**	**[$31.8, $42.8]**

The results seem highly practical. On average, a household would be willing to contribute between $32 and $38 annually to continue bundled library services for all. As evidenced by Figure 3, the multiple split model incorporates many draws around $0 and $100. Also, there is a lot of variance in individual household estimated WTP as was expected and the raw data indicated. While not directly comparable, the mean donations seem in line with the price for annual memberships of many potential substitutes: in Duluth, for example, household memberships to Hartley Nature Center ($50), Duluth Children's Museum ($55), Lake Superior Zoo ($65), and Great Lakes Aquarium ($70) are on the same order of magnitude as this average.

Discussion

In policy applications the mean and median have different interpretations. Herein, since each household's WTP is represented by a draw from the distribution to purchase one library service bundle, the total donation can be found by summing all these individual household donations (for a visual representation compare Figures 2 and 3). Mathematically, this sum is identical to multiplying the mean by the number of households. Therefore, the estimated range of total donation for library services in Minnesota is found by multiplying our mean interval by the estimated 2,061,882 households in the state (US Census, 2009). The total donation interval is [$65.4 million, $79.0 million].

On the other hand, the median is the 50th percentile of the distribution. From a policy perspective it is the donation amount where a simple majority is obtained. Therefore, a simple majority of households would be willing and able to donate between [$31.8, $42.8] for library services per year.[18] There is a striking resemblance between the mean and median interval. This is occurring for one reason—the mean and median of the logistic distribution are equal, simulation and income splits are the source of the deviations. In the models with income splits, low value draws are pulling the mean down relative to the median; this leads to the higher upper bound value of the median in the final intervals. Given these facts, it is suggested that the final median value interval be the same as the mean.

It is of interest to note that this valuation survey was conducted during a period of slow growth after a lengthy recession. A recent working paper (Loureiro and Loomis, 2010) suggests that values can decrease significantly in a CVM during a recession. For example, national estimates of WTP to avoid a future oil spill (similar to one that occurred in 2006) in Spain were lowered significantly from 2006 to 2009. However, estimates from a geographical area closer to the real spill site were not statistically lower (although point estimates of median WTP did fall substantially). Given that libraries (and online library access) are generally available throughout

[18] It is tempting to suggest that this is equivalent to the amount of tax that would pass in a statewide referendum for library services. However, since taxes are typically paid by all whereas donations are expected to be provided only by those who value the good or service the two are not the same (see background section for a defense of using donations in this application).

the state, these results seem to suggest a muted response. (This response would be different if libraries were only available in one of the Minnesota Census regions.) Markets are dynamic, and we suggest it is best to consider these results as a snapshot of library value for the time of the study. Many factors influence demand, including—perhaps the most relevant to this study—changes in tastes and preferences, prices of substitute goods and services, income, and number of buyers. Due to these considerations, we suggest that rather than making subjective adjustments to the current study findings the valuation survey and analysis be repeated, if it is thought that economic conditions severely hampered the results.

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Questionnaire

LIBRARY SURVEY

THE MINNESOTA DEPARTMENT OF EDUCATION has asked the University of Minnesota Duluth to collect information about Minnesota's public libraries. The report will be available to the general public through the UMD Bureau of Business and Economic Research and through the project funder, the Minnesota Department of Education. All survey information is strictly confidential and your answers will be put with a lot of other people's so you can't be identified in any way. The UMD research bureau will be glad to answer questions about this research at:
(218) 726-8730, or email jskula@umn.edu.

Thanks very much for your help!

Donations to non-profit organizations include well-known entities such as the Public Broadcasting Service, also known as PBS.

Think of the television shows and Web sites provided by the Public Broadcasting Service known as "PBS." PBS relies on donations to pay for its services. What if *you* were contacted to make a donation?

Keeping in mind your household's current income . . .

1. Would you be willing and able to donate $___ per year for **PBS** to continue its services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___.

2a. IF YES:
Would you be willing and able to donate $___ per year for **PBS** to continue its services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___.

2b. IF NO:
Would you be willing and able to donate $___ per year for **PBS** to continue its services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___

Another non-profit entity most people are familiar with is the city park.

Think of the services provided by the city parks close to your neighborhood. Imagine the city had to collect donations rather than tax dollars to keep park services available. What if *you* were contacted to make a donation?

Keeping in mind your household's current income . . .

3. Would you be willing and able to donate $___ per year for the **city** to continue park services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___.

4a. IF YES:
Would you be willing and able to donate $___ per year for the **city** to continue park services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___.

4b. IF NO:
Would you be willing and able to donate $___ per year for the **city** to continue park services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___.

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Public libraries are also non-profit organizations.

5. This past year, have you or someone in your home checked out books, CDs, DVDs, videos or tapes from a public library in your community?
[ ] YES
[ ] NO

6. This past year, have you or someone in your home used a public library's online services from home such as checking the library catalog or downloading an ebook, audio book, eflick or podcast?
[ ] YES
[ ] NO

7. This past year, have you or someone in your home used the public library as a place to meet friends, attend special library events, or read books and magazines?
[ ] YES
[ ] NO

8. This past year, have you or someone in your home asked a librarian to help find information, or used reference materials at the public library such as medical or technical information or materials to search for a job?
[ ] YES
[ ] NO

9. This past year, have you or someone in your home used a computer in the public library to connect to the internet or to prepare documents?
[ ] YES
[ ] NO

Imagine that the library had to collect donations (rather than receiving tax dollars) to keep all these library services available for you and others. What if *you* were contacted to make a donation? Keeping in mind your household's current income . . .

10. Would your household be willing and able to donate $___ per year for library services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___.

11a. IF YES:
Would your household be willing and able to donate $___ per year for library services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___.

11b. IF NO:
Would your household be willing and able to donate $___ per year for library services?
[ ] YES, my household would be willing and able to donate $___.
[ ] NO, my household would not be willing and able to donate $___.

12a. IF "YES" to Either Library Donation:
Suppose that your household was contacted TODAY to donate __*[enter highest "YES" amount]*__. (Only *imagine* that you were contacted.) Keeping in mind your household's current income, how likely would you be to actually donate this amount?
[ ] Very likely
[ ] Somewhat likely
[ ] Somewhat unlikely
[ ] Very unlikely

12b. IF NO/NO: [select most important]

Please tell us the most important reason why you selected "NO" to both questions:

[ ] Library services are not worth the amounts listed to my household
[ ] My household does not have money to spare
[ ] I don't understand the questions
[ ] I don't trust the library to spend money wisely
[ ] I don't know how this survey will be used
[ ] Other

Thank you for answering all these questions! Your time is greatly appreciated.

OTHER COMMENTS:

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