About JVS

How-To Guide for States Implementing a Job Vacancy Survey

National JVS Workgroup
November 2002

A joint project of:

Bureau of Labor Statistics
Employment and Training Administration
State Labor Market Information Offices

Report Purpose

This manual is designed to provide basic instructions and information to help Labor Market Information analysts and others develop and run local and statewide Job Vacancy Statistics Programs. This manual includes a bibliography on job vacancy surveys and information, an introduction to the questionnaire and software developed by the National Workgroup, and helpful tips on conducting and marketing your Job Vacancy Survey among other useful information. Sections of the manual were written by staff at the Bureau of Labor Statistics, the Minnesota Department of Economic Security and the Colorado Department of Labor and Employment, all under the auspices of the National JVS Workgroup which provided the final review. The Workgroup intends to update this manual as needed and as funding is available.

About JVS: How-To Guide
Table of Contents

Introduction

While Labor Market Information in the U.S. is extensive and reliable, including information on employment, unemployment, wages, benefits and labor force demographics, until recently little has been known about job vacancies. The development of standardized state Job Vacancy Statistics programs is meant to remedy that gap. The purpose of such programs is to collect, compile and disseminate statistically reliable data on current job vacancies. These data serve as demand side indicators of labor shortages at the state and local levels. Specifically, job vacancy statistics provide:

- A measure of employer demand for workers in local communities
- An analysis of the characteristics of vacancies, including
  - Wages and benefits offered
  - Education and experience requirements
  - Full or part-time positions
  - Length of time vacant

Paired with other labor market data, job vacancy statistics provide an indicator of labor market tightness, labor force shortages and the overall health of the state or local labor market.

Such information is useful to more than economists and analysts. Job vacancy statistics, when presented in an accessible way and marketed to the appropriate audiences, are useful to the following labor market information customers:

- Hiring managers and human resource professionals may use this information to determine hiring competition and to prioritize human resource needs.

- Employment and training service providers may use this information to plan employment services and workforce development strategies.

- Counselors, instructors and educational planners can use this information to identify workforce development priorities and aid students and jobseekers to identify occupations that are in demand.

- Policymakers are informed of the location and magnitude of job vacancies and the quantity and quality of current open-for-hire positions.

There has been no nationwide effort to develop such statistics until recently, despite 60 years worth of study and research on job vacancies and related topics (see bibliography, page 6). However, this is changing. The Bureau of Labor Statistics (BLS) has recently released data from its new Job Openings and Labor Turnover Survey (JOLTS) program. These data serve as demand-side indicators of labor shortages at the national level. Prior to JOLTS, there was no economic indicator of the unmet demand for labor with which to assess the presence or extent of labor shortages nationwide. Specifically, JOLTS collects data on total employment, job openings, hires, quits, layoffs and discharges, and other separations.

The Job Vacancy Statistics (JVS) Program differs from JOTLS in method, scope and intent. For example, the Job Vacancy Survey collects data only on job vacancies, not hires, quits, layoffs and discharges and other separations as does JOLTS. The JVS, on the other hand, collects data wages, benefits, skills and education requirements. Moreover, the Job Vacancy Survey is designed to be implemented at the state or local level, rather than the national level. While JOLTS and Job Vacancy Statistics data are not comparable, the information produced by Job Vacancy Surveys is complementary, providing local or statewide detail on job vacancies. The following section explains how the Job Vacancy Statistics program came about.

National Job Vacancy Survey Workgroup: Background

In 1998 Congress passed the Workforce Investment Act (WIA) which provides that customers have access to employment statistics information, including accurate “job vacancy listings” for local, regional, and national labor market areas. The law provides that this information be used to assist customers who are not able to find jobs obtain training linked to job opportunities in the area. The Department of Labor's Employment and Training Administration (ETA) administers a number of programs related to these directives and is a key player in working with states to develop Job Vacancy Statistics. The ETA has already approved using One-Stop LMI funds to develop job vacancy statistics. Moreover, the Workforce Information Council (WIC) has determined that developing job vacancy statistics is a major priority for states.

Many Workforce Investment Boards (WIB) are interested in obtaining job vacancy statistics. Labor Market Information (LMI) Offices are well positioned to produce these statistics because they are generally the designated LMI offices in their state. Also, they have the expertise to administer employment statistics programs developed by the BLS and the confidential employer data from which to select a scientific sample.

However several obstacles have, in the past, limited the development of JVS in most states. The first obstacle has been limited expertise on how to design a survey instrument, select a valid sample of businesses to participate, weight the responses from these businesses, and correctly produce reliable estimates from responses to the survey. The second obstacle has been the lack of software and other tools to assist states in these tasks. The final obstacle has been the limited resources for data collection and analysis outside of BLS programs.

The JVS National Workgroup was formed to serve as a resource for the states in their attempt to meet the WIA mandate and WIC goal of producing job vacancy information. Workgroup members include staff from BLS, ETA and nine state LMI offices. The Workgroup's stated goals are to help states:

1. Produce and disseminate timely state and local occupational job vacancy statistics.
2. Employ statistically rigorous methodology.
3. Develop comparable statistics across States and local areas.
4. Reduce the startup and overhead costs.
5. Promote the use of job vacancy statistics.

In order to overcome some of the obstacles of collecting reliable job vacancy statistics, the JVS National Workgroup, funded by the BLS and ETA, is developing a JVS system, which includes the following tools:

- Survey instrument
- Sample allocation and selection software
- Data capture system including occupational coding
- Estimation production system
- Tools for presentation

All of these tools are discussed in this publication. Workgroup members hope that states will use these tools, along with this report which pulls together the JVS Workgroup's collective knowledge on conducting statistically sound job vacancy surveys, to develop reliable and comparable job vacancy statistics. The Workgroup also holds workshops for states as demand arises.

The Workgroup meets twice a year. At the time of publication of this report, membership is as follows:

- **Bureau of Labor Statistics:** Shail Butani (Workgroup Co-Chair), Craig Offutt
- **Employment and Training Administration:** Olaf Bjorklund
- **States**

Colorado:	Alexandra Hall
Florida:	George Foster
	James Finch
Maine:	Robert Kelley
Maryland:	Bo Szczepaniak
Minnesota:	Jay Mousa (Workgroup Co-Chair)
	Oriane Casale
New Mexico:	Herb Greenwall
New York:	Rod Fortran
Wisconsin:	William Brockmiller

Selected Bibliography

The following is a select list of job vacancy survey references which may be useful to individuals conducting a job vacancy survey:

Abraham, Katharine G. "Structural/Frictional vs. Deficient Demand Unemployment: Some New Evidence," *American Economic Review* 73, September 1983.

"Help-Wanted Advertising, Job Vacancies and Unemployment." *Brookings Paper on Economic Activity* 1, 1987.

Clark, Kelly A. and Rosemary Hyson. "New Tools for Labor Market Analysis: JOLTS," *Monthly Labor Review*, December 2001.

Cochran, William. Sampling Techniques. 3rd edition. Wiley Series in Probability and Mathematical Statistics – Applied, 1977.

Conference Board. "Help Wanted Advertising Index." Website: www.conference–board.org

Holtzer, Harry J. *Unemployment, Vacancies and Local Labor Markets*. W. E. Upjohn Institute for Employment Research, 1989.

Job Openings and Labor Turnover Survey. Website: www.bls.gov/jlt

Sarndal, Swennson, Wretman. Model Assisted Survey Sampling, 1992.

Schaeffer, Mendenhall, & Ott. Elementary Survey Sampling, 5th edition, 1996.

University of Wisconsin-Milwaukee Employment and Training Institute. "Surveying Job Vacancies in Local Labor Markets: A How-To-Manual." Milwaukee: University of Wisconsin-Milwaukee, 1998. Website: www.uwm.edu/Dept/ETI/manual.htm

Survey Timeline and Resources

Sample Timeline
Below is a brief timeline for implementing a job vacancy survey:

Time	Task
T	Draw sample
T	Begin cleaning sample • Identify the businesses with an out-of-state address or no address. • Identify multiple units (for example, cities, counties and school districts). • Identify businesses with the same mailing address.
T + 1 Week	Start contacting certainty units and correcting addresses • Call large employers to verify mailing addresses and get contact names. • Find addresses for businesses with an out-of-state address or no address.
T + 2 Weeks	Print and mail postcard.
T + 3 Weeks	• Start correcting bad addresses • Correct addresses from returned postcards.
T + 3 Weeks	Finalize design of survey instrument, cover letter, and mailing insert.
T + 4 Weeks	Print surveys and inserts.
T + 4 Weeks	• Finalize sample database • Finalize mailing list.
T + 5 Weeks	• All surveys mailed. • Begin data entry. • Begin coding occupations.
T + 7 Weeks	• Print and mail 2nd round • Continue data entry. • Continue coding occupations.
T + 9 Weeks	• Print and mail 3rd round. • Continue data entry. • Continue coding occupations. • Begin reminder calling.
T + 11 Weeks	• Print and mail 4th round. • Continue data entry. • Continue coding occupations. • Continue reminder calling.
T + 14 Weeks	• Finalize database for data analysis. • Finish coding occupations.

Time T
The survey round begins approximately one month before the first mailing is actually sent. The more time spent on contacting businesses and updating addresses the more time will be saved later when the first round of the survey is mailed. During this month, all decisions on the survey database, sampling methodology, survey instrument and accompanying letters should be made.

Time T+1 to Time T+5
As soon as the sample is received, data cleaning and contacting certainty units begins. Editing the database can identify businesses that have an incomplete address for mailing. Cleaning the data consists of identifying duplicate units within the sample. For example, the sample may contain numerous sites with a school district. It is also important to identify the units that do not wish to participate, or are out-of-business. The units with large numbers of employees are contacted for the purpose of verifying addresses, establishing contact with the person responsible for hiring, determining whether this unit hires for other units, and notification of the upcoming survey. Calls to these businesses will improve the database prior to the first mailing of the survey.

Sending the pre-mailing postcard during the second week of the survey round provides enough time for undeliverable mail to be returned. A pre-mailing postcard is extremely helpful in identifying businesses which have moved, are out-of-business, or have an updated mailing address. A graphics artist may design the postcard and retains it electronically so updates are easily made for future surveys. Mail the postcard as early as possible; four weeks in advance is sufficient time. The earlier the postcards can be mailed, the more time will be available to receive, verify and correct addresses to improve the database prior to the first mailing.

Postcards are an excellent way to verify mailing addresses. The Post Office will return:

- Some with an address correction label attached; simply make the correction prior to the first survey.

- Some marked “Forwarding Order Expired;” this implies that the business is still active so a new address should be attainable. Search electronic and paper directories for a better address; if time permits, call the business to verify they are the unit in the sample.

- Some marked, “Moved left no address;” this suggests either the business is under a new name or the business has closed. While it may not be easy to find a new address if the database has a contact phone number listed, it may be helpful to attempt to contact the firm.

- Some marked “No mail receptacle;” this suggests that while the physical location address is viable, the proper mailing address will be a P.O. Box number. If the database has a contact phone number listed, it is usually a good source for finding the appropriate P.O. Box number.

- And some will have other reasons for return listed such as: “No such street”, “No such number”. As time permits, exhaust all avenues to ascertain the reason these were returned as undeliverable.

Address correction services are requested from the U.S. Postal Service and provide corrected addresses whenever possible. When no address is available, Internet telephone books are used to find updated addresses and telephone numbers. Address refinement continues throughout the mailing process.

Mailing Questionnaires
The first mailing is not sent until the fifth week out or the first week of the appropriate quarter. Since this is the largest mailing that yields the highest response rate, it is necessary to have the sample as clean as possible and have all necessary items ready.

Data entry begins immediately after responses begin to come in. Staying on top of data entry and occupational coding is important. The subsequent mailings are sent at two week intervals. Reminder calls are conducted subsequent to the third and fourth mailings. Data entry and checking continues until fourteen weeks out -- when the database is finalized.

Important Office Resources

Communications Unit
A toll free telephone number may be included for the benefit of employers. Employers should be instructed to call if they have any questions, want an alternate response method or to verbally complete their survey over the telephone.

The hotline should be available to two or more staff so that the incoming calls are answered immediately during normal work hours. Phone coverage should continue even if one of the staff members is unavailable. Voice mail should be installed so employers may call at their convenience any time during the day and leave a question, comment, or information for staff to process within one working day. Job vacancy survey staff members should answer the line differently than their personal office number, calling it the “Job Vacancy Hotline.”

The toll free number may continue to be “active” even after the data collection period had ended. This allows late responders to have their information and questions processed even if the data is too late for inclusion in the survey results.

Mailing, Duplicating and Data Processing Unit

Preparing surveys for mailing required the assistance of the mailing, duplicating and data processing unit. The staff should be notified well in advance of the survey schedule in order to place it on their timetable. Typically, this unit prints, addresses, stamps and mails the postcard, cover letter and survey instrument.

For one round of the survey, the mailing, duplicating and data processing unit:

- Prints and folds the cover letters and survey instrument.
- Stuffs folded materials, along with a business reply envelope, into window envelopes with the employer address appearing through the window.
- Seals the mailing envelopes and stamps postage paid amounts on all envelopes.
- Coordinates pick-up by the U.S. Postal Service.

This process is repeated for each successive survey mailing every two weeks.

Instructions for Callers and Frequently Asked Questions

General Instructions for Callers

Employers randomly selected may have to be called to provide either a proper mailing address, or to be persuaded to provide the survey information. While units with large employment (generally, weight equaling 1.000) need to be contacted prior to the initial survey, other units may include businesses in select industries and/or geographical areas that have a low response rate following the third survey mailing, but prior to the data collection cutoff date.

Some general calling instructions for job vacancy survey staff follow:

1. Develop a flow chart that moves through a mock conversation with a company representative. For each point allow the representative to question, or to express concerns about the survey. Provide job vacancy survey staff with possible discussion points to overcome the employer's perceived problems with the survey process. Refine the flow chart as job vacancy survey staff gathers experience with the interview procedure.

2. Begin with a salutation/greeting that identifies the job vacancy survey staff member and the agency, and then continue with the purpose of the call.

3. Often the business contact will be a receptionist who will forward your call to a proper representative. Ask the first contact to spell (and correctly pronounce!) the name of the person to whom you are being transferred. You will be ready to use the person's name from moment one and if you get the person's voice mail you will be able to use their name properly in your message. You want

them to be responsive and to call you back; using their name increases the chances that a response will follow.

4. Be prepared to assure business representatives that all data provided by each company are maintained in the strictest of confidentiality, as no information will be made public that would identify a particular company. Discuss how data are combined by industry and by area to disguise any individual business unit's information, while at the same time being combined with data from other companies to provide a reliable database to produce a summary document that will be used by many interested parties.

5. Be prepared to offer the employer a variety of ways to provide the information; by mail, by fax, by Internet, or by telephone, which is particularly useful if the employer has no current job openings. Have a toll-free number available to employers who are reluctant to call at their own expense. If all these options fail to generate a favorable response, offer to download the information from the company's web site, if that is an option. Some web sites are very productive, having the core information ready to plug into a survey once job vacancy survey staff gains permission from the employer to access the data. Some web sites, however, may be difficult to read, or may not have all the information available.

6. Be prepared to deal with a lack of enthusiasm on the part of employers. Your flow chart should direct job vacancy staff to statements that will overcome employers' initial concerns. Be prepared to discuss the benefits of their company's participation such as:
    - Education and community planners may benefit by using the information developed to plan education and training programs.
    - Survey results may also benefit the participating businesses' payroll and human services units. The information collected from a statistically reliable sample may provide current benchmarks in beginning wages by occupation, by geographic area, or by employment level. Employers may also compare the length of time job postings have gone unfilled in their industry with their own company's experience.
    - Information will be used by job seekers to identify occupational pursuits that have a higher expectation of employment opportunities. Data are also helpful to placement personnel, whether private or public, who direct information to jobseekers so they can make informed career decisions.

7. If all efforts fail to persuade the business representative to provide a response, remember to be courteous and thank them for their time. Perhaps once publicity around the JVS results reaches them they will recognize the value of the information and provide the requested information for future survey rounds.

Sample Questions for Job Vacancy Survey Staff to Ask Employers during Address Verification Contact

May I please speak with ____________________? (Add person's name if known.)

Or

May I please speak with someone in the Human Resources office, or whoever is in charge of hiring at your firm? (Make note of person's name and phone number to whom you are being transferred.)

Hello, my name is _______. I'm with the (state agency). In (month) our agency will be sending a survey to (number of firms in sample), randomly selected from the master employer list of (number of employing units in state). We would like to verify the address and name of the person to whom we should address the survey.

Some employers have multiple employment sites; banks are a good example; ask contact person if s/he is responsible for hiring at all, most, or some branches. Try to identify which sites in the sample could be combined into one survey request. For example, branches of a bank located in several population centers could be consolidated on one survey if all were in the same geographic region. This would ease the efforts required of the employer, as well as the data entry person's efforts. Remember to indicate on all affected surveys that the relevant information is available on a single survey.

Sample Comments and Questions for Job Vacancy Survey Staff to Use when Calling Non-Respondents

Hello, my name is _______. I'm with the (state agency). Our agency is conducting a survey of current job vacancies at (state) firms. We appreciate those employers who have been able to provide the information and we would like to add your information to the survey.

We have several ways for you to provide the information including returning a survey by mail or fax, or we have a web site for employers to use if it is more convenient. We also accept printed reports of current vacancies or we would be happy to retrieve the information from your company web site.

Sample Comments for Job Vacancy Survey Staff Responding to Employers Calling with Questions or Responses to the Survey

1. Why should I participate?

The [your state] Job Vacancy Survey will identify the number and types of jobs available in specific industries and regions. Your business has been randomly selected to represent similar businesses in your industry and your region. Your participation is essential to develop accurate, useful information.

Findings will assist schools, employment and training services, and local workforce councils to respond to industry needs.

2. (if applicable) Where can I get a copy of findings?

A copy of the most recent report can be obtained on the Internet at [your web site], *or we can mail you a copy. Please call [your number] or toll free, [your number].*

3. Will my company's information be accessible to the public?

All responses to the survey are considered nonpublic information. We will use collected responses to produce summary statistics on regional hiring needs by occupation, industry and region. No data identifying individual firms will be published or released. Information collected from this survey will be shared only with organizations cooperating in survey analysis.

4. Who uses this information?

See uses and benefits page.

5. Is this survey mandatory?

No, your participation in this survey is not required; however, it is highly appreciated.

Sampling Methodology

Drawing the Sample

Drawing a sample is the first step in conducting a job vacancy survey. It is also one of the most important steps because it allows for the development of statistically reliable estimates of job vacancies. Each state must determine its own requirements for its sample. The following steps represent the decision process Minnesota went through to set our sample requirements. The next section is an overview of the sampling software that has been developed to assist states to pull their samples.

Sampling Methodology: Minnesota's Experience

Defining strata

The sample design for the *Minnesota Job Vacancy Survey* included three steps. The first step involved defining the strata for which estimates on job vacancies in Minnesota were desired. Three strata were identified: (1) industry as classified at the two-digit NAICS code, (2) firm size, and (3) region.

There are 20 industrial divisions. The stratum of firm size included four classes: (1) very small firms, or firms with 1 to 4 employees, (2) small firms, or firms with 5 to 49 employees, (3) medium firms, or firms with 50 to 249 employees, and (4) large firms, or firms with 250 employees or more. The region stratum was divided into two classes: the Twin Cities seven-county metropolitan area and the balance of the state or Greater Minnesota. These two regions were further divided into a total of 11 Service Delivery Areas (SDA). Nine SDAs defined the Greater Minnesota region while two SDAs defined the Twin Cities metro area.

Job Vacancy Survey Sample Allocation and Selection System (JVSSASS)

Background

The JVSSASS program operates on a PC platform using Microsoft Windows. It uses Visual Basic as a user interface to collect information for defining variables and then executes a SAS program. The program reads a file of employer records (the frame) and based on user provided information determines sample requirements across user defined population groups, known as strata, and then selects a random sample in each stratum and provides an output file (the sample).

Features:

Scope and stratification

The software allows the user to *limit the survey scope* by employment size of the establishment, industry, ownership, or geography. The user can *stratify the population* into groups defined by one of several employment size classifications, one of several industry classifications, by ownership, and by geography with choices of county, town or user defined areas.

Sample size

The JVSSASS allows the user to specify the number of sample units to select, or to determine the sample size by setting a target percent relative standard error for the estimate of the population sampled. The relative standard error is defined as the standard error divided by the estimate. It specifies the percentage of error that can be tolerated, for example plus or minus 10 percent on the number of job vacancies.

JVSSASS will also allow you to target a relative standard error for estimates from each group from one of the dimensions of stratification--size, industry, ownership, or geography--and set minimum sample requirements necessary to achieve that target.

Defining certainty selection

The user can also define certainty strata based on ownership or employment. These are strata where all establishments would be selected and assigned a selection weight of 1.000. Other units might be selected with a weight of 1.000, but those units are not absolute certainty; they are selected with a weight of 1.000 because the allocation process determines such a sampling fraction is efficient.

Setting minimum and maximum sample in strata constraints

A user can also set minimum and maximum strata sample sizes. Achieving at least some minimum sample size is important because estimation methods typically require at least one unit per strata: some methods used to estimate sampling error require at least two units, and response to surveys is rarely 100 percent. It is advisable to set a minimum sample of units in each strata. Generally, there must be a minimum of three units in each strata subject to the constraint that three units are in the population. Setting the maximum sample size per strata prevents excessive amounts of sample in any one stratum.

User provided files

To provide additional flexibility for area surveys, this software allows a user to define areas by county and town with a text file. It also allows the user to provide a file of population characteristics estimated from earlier surveys to assist in the allocation process. This is a comma separated value file (CSV). The first 4 entries are strata identifiers--ownership, industry, employment size class, and geography. The next entry is an estimate of the item of interest, for instance job vacancies. The sixth entry is the standard deviation of the item of interest. The last entry is the number of establishments or records in the strata.

Method

The software allocates the sample using the Neyman method. The Neyman method takes a larger sample in a given stratum if: (1) the stratum is larger, and (2) the stratum is more variable internally. If the user provides total sample size, that sample is allocated using this method. If the user specifies a target relative standard error, the sample size necessary to achieve that error is determined by adjusting employment data to compensate for the fact that you are estimating a rare event (job vacancies), and assuming a stratified sample. The software allocates the number of expected sample responses (sample size multiplied by the expected response rate) using the Neyman method. The resulting sample sizes within each stratum are inflated by dividing the number of units selected by the expected response rate in each stratum.

The Neyman method distributes sample across strata in the same proportion as the product of the strata standard deviation and the number of strata units relative to the sum of this product across all strata. (The standard deviation is a measure of dispersion of the item of interest across population units within the strata.)

$$n_h = n \times \frac{N_h s_h}{\sum_{h=1}^{h=H} N_h s_h}$$

where $\boldsymbol{n}$ is the total sample size, $\boldsymbol{n_h}$ is the strata sample size, $\boldsymbol{N_h}$ is the number of population units (in our case establishments or UI reporting units) and $\boldsymbol{s_h}$ is the standard deviation within strata of the variable of interest (for instance, job vacancies).

The resulting allocation is checked to determine if minimums are met, and maximums and strata population levels are not exceeded. After adjusting the sample for these constraints, the remaining sample is allocated across the remaining unconstrained strata. The resulting allocation is once again checked and the process is repeated if necessary.

The population variances necessary for allocating sample are often not available. This software asks the user to make the assumption that the mean of employment or the standard deviation of employment is proportional to the standard deviation of the variable of interest when the variances are not available.

The user can let the software determine the number of sample units required when a user-specified relative standard error for the survey estimate is used. The amount of sample required for a given relative standard error is determined using the following relationship.

$$n = \frac{\left(\sum_{h=1}^{h=H} N_h s_h\right)^2}{\left(\left(\left(rse \times \sum_{h=1}^{h=H} x_h\right)^2\right) + \sum_{h=1}^{h=H} N_h s_h^2\right)}$$

where $\boldsymbol{rse}$ is the target relative standard error and $\boldsymbol{x_h}$ is the value of the variable of interest in each stratum (job vacancies) or an estimate of that. When the user does not provide estimates of x_h for the allocation process, the program estimates it as 3% of total employment, to simulate estimation for a rare characteristic.

In this version of the software, the designation of certainty, setting minimum or maximum strata sample sizes, or targeting the relative standard error for one of the strata dimensions will cause departures from any overall target error that was specified.

Requirements
The JVSSASS program operates on a PC platform using Microsoft Windows. The PC must have access to SAS version 6.12 or higher. It requires only the Base module from SAS. It has been successfully tested on a Pentium 2 with 64 MB RAM, but memory requirements and speed of operation will depend on the size of the files being processed, the requirements specified by the user and the computing resources of the PC. The required input file (the frame) must be in EQUI (LRECL=725) format and include only one quarter of data.

Outputs
The JVSSASS program selects a simple random sample without replacement within strata. The resulting output is a file in EQUI format plus a sample weight field (numeric 10.3), a schedule number with check digit for 6 positions, and a strata identifier that is up to 13 positions long, for a total record length of 755.

It will also write a comma delimited text file describing the sample selected to a *"jobvacancy"* folder on your PC. Because of the flexibility given the user, it is possible to specify design requirements that are inconsistent and lead to a less efficient result or no output result whatsoever. This file should be reviewed carefully to verify that the design requested was delivered and that it is reasonable.

The Job Vacancy Survey Sample Allocation and Selection Software provides users with conventional methods for allocating and selecting samples for establishment surveys based on stratified designs. It was developed with the intention of providing sufficient flexibility to meet the users' needs in selecting samples for job vacancy surveys. To do this, the software provides a wide variety of options in limiting survey scope, defining strata and allocating the sample.

Data Collection

Survey Instrument
Employers are asked to supply information on the number of open for hire job vacancies including the job title, whether the vacancy is temporary/seasonal, part-time and full-time status, job vacancy duration, education and experience requirements, wage or salary, and benefits.

A copy of the job vacancy survey instrument, designed by the National JVS Workgroup and cognitively tested by Westat, Inc. under guidance from BLS, is available on the National JVS Website at www.JVSinfo.org or through the JVS Helpdesk at JVS.mail@state.mn.us. The survey instrument has been field tested by several states including Minnesota.

A unique identification number is given to every employer so an industry, size class and region can be attributed to each returned response. States may need to make small amendments to the location of the address and the survey identification number of the form to accommodate their specific mailing and database needs. The only required fields (these are required by the Data Capture software) are column A: "Job Titles for Vacancies" and column B: "Number of current job openings." The survey instrument was also designed to allow States to select up to five different types of benefits to include. For the core survey instrument, the National Job Vacancy Survey Workgroup selected the four common benefits (health insurance, paid vacation, paid sick leave, and retirement savings or pension plan) plus a column for no benefits.

Cognitive Testing of Survey Instrument

The National JVS Workgroup had the survey instrument tested by survey methodologists to determine whether respondents understood the terms and survey concepts, whether they had the information available to answer the survey questions, and whether they could easily follow the survey form. The process involved enlisting the participation of a small sample of firms. After receiving some background information on the job vacancy survey, interviews were set up in which the participants filled out the survey form and answered a series of questions designed to confirm that the information being reported was consistent with each question's objective. Respondents were also given the opportunity to provide feedback on all aspects of the survey instrument.

The testing indicated that the survey form and key concepts were generally understood by the respondents and the information to answer the questions was easily accessible. The feedback identified some minor improvements that would enhance the directions, including how to indicate which unit of a multiple location employer the survey is asking the respondent to report for and how to respond if the business has no vacancies.

The cognitive research also pointed out instances of terms and phrasing in certain questions which did not correspond precisely enough with the same aspects of the job vacancies that employers were reporting on. The data items in question included the following: whether a job opening was a permanent versus temporary position, how long the employer had been trying to fill the vacancy, education and experience requirements, and health insurance and retirement benefits. Simple changes in terminology and phrasing were made to address these issues.

Detailed experience requirements proved to be too idiosyncratic for collection in such a short survey. For example, some respondents wanted to report years in a specific position or field; others wanted to report a specific skill set. The survey instrument will only collect information about experience in broad terms, and the wording was slightly modified to make the three general categories of experience clearer.

The testing also proved that the survey could not ask respondents to report pay for all vacancies in terms of an hourly wage. Respondents could easily report hourly wages for vacancies that paid by the hour but could not easily or accurately report an hourly wage for vacancies paying annual salaries. Respondents also tended to want to report a range of pay rather than a specific amount. The form was amended to allow respondents to report hourly, monthly, or annual compensation. There is room, if the respondent wishes, to report a range rather than a single amount.

Mailing Inserts — Minnesota's Example
Prior to the survey, a postcard is sent to each sampled business. Below is a sample design of the postcard.

It's coming.....

2002 Minnesota Job Vacancy Survey

Surveys will be mailed out April 1st. You can return your survey by mail, fax or complete your survey on the web. We hope to receive your completed Minnesota Job Vacancy Survey by April 15th.

Call (877) 396-6381 or (651) 297-1651 if you have any questions.

Thank you!

In addition to the survey itself, employers are sent a letter describing the intention of the survey. This letter was included in the first mailing only. A shorter follow-up letter was included in the subsequent three mailings. On the next two pages are examples of Minnesota's cover letter and follow-up mailing insert:

Minnesota Department of
Economic Security
390 North Robert Street • St. Paul, Minnesota 55101
(651) 296-6545 • TTY/TDD (651) 282-5909 • FAX (651) 282-5429

Research and Statistics Office

Dear Employer:

The economic environment in Minnesota is dramatically different than it was just one year ago. The Minnesota Department of Economic Security (MDES) estimated 80,000 job vacancies in Minnesota in fourth quarter (October to December) 2001. This was 43 percent fewer job vacancies than were estimated one year ago.

The spring round of this survey is now being conducted to again identify the current number and types of job opportunities available. *Your participation in the study is essential to develop accurate, useful information.*

Survey results assist schools, employment and training services, and local workforce councils in guiding students and jobseekers. Most importantly, the survey results also assist, you, the employer, in planning solutions to hiring needs. For highlights of the most recent report, please visit our website at http://www.mnwfc.org/lmi/jobvacancy/site/ or for a copy of the survey findings please call 651.296.6545 or toll free 1.888.234.1114.

Your response is the only way we can obtain this timely and important data. Your participation is essential to develop accurate and useful information on job vacancy trends. The survey should take just a few minutes to fill out, and we've enclosed a postage-paid envelope for your convenience. No information identifying your firm will be published or released.

Please direct this survey to the manager or human resources professional responsible for recruiting and hiring at your business.

If you have any questions regarding the *Minnesota Job Vacancy Survey* or want an alternate method for completing the survey, feel free to contact Mike Casey at (651) 297-1651, or toll free at 1-877-396-6381.

Thank you for your time and participation in this survey. ***Every response is important and essential to the production of high quality information.***

Sincerely,

Roger Hale
Chairperson, Governor's Workforce Development Council

Earl Wilson
Commissioner, Minnesota Department of Economic Security

Dear Minnesota Employer:

We recently sent you a *Minnesota Job Vacancy Survey*. If you have already returned your survey, we thank you very much.

However, for those who have not, please be assured that your timely response to this survey is very important to the completion of the *Minnesota Job Vacancy Survey.* Your response will be confidential and no employer-specific data will be published.

Remember, **information from all employers**, regardless of the size of your business, **is of equal importance** to producing good job vacancy information.

Also, **please return the survey even if you have no current job vacancies.**

We have several convenient options for you to return your survey form:

- By postage-paid envelope
- By the Internet at www.MnWorkForceCenter.org/lmi/jobvacancy
- By Fax at (651) 282-5429
- by website (if you have a website listing current open-for-hire vacancies, provide us with the web address and we will take care of the rest),

Or

- If you have **no vacancies** at this time you may call **651-297-1651** (or toll-free at **1-877-396-6381**) and leave the company name and the nine-digit survey ID number that appears above your mailing address, with the statement that your company has no vacancies at the present time.

If you have any questions, please call **Mike Casey** at **(651) 297-1651** or toll-free at **1-877-396-6381** or by e-mail at mike.casey@state.mn.us

We hope to hear from you soon!

Alternative Response Methods
For a mail out survey, giving businesses the option of responding using an alternative format increases response rates. These alternative response methods include

- Fax: The survey may be faxed in rather than mailed.

- Internet: The survey may be filled out on the Internet. See the section on the Internet survey instrument below for more information.

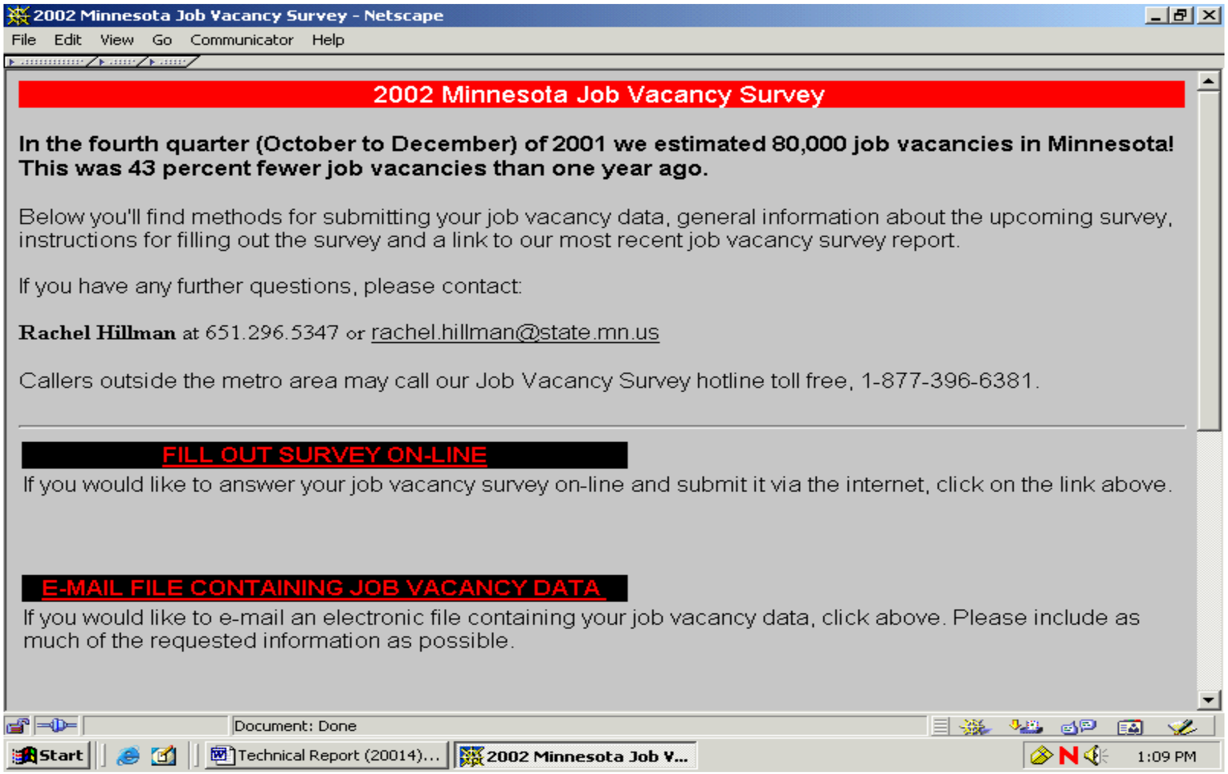
- Electronic document: An electronic document listing job vacancies may be e-mailed to the job vacancy survey coordinator.

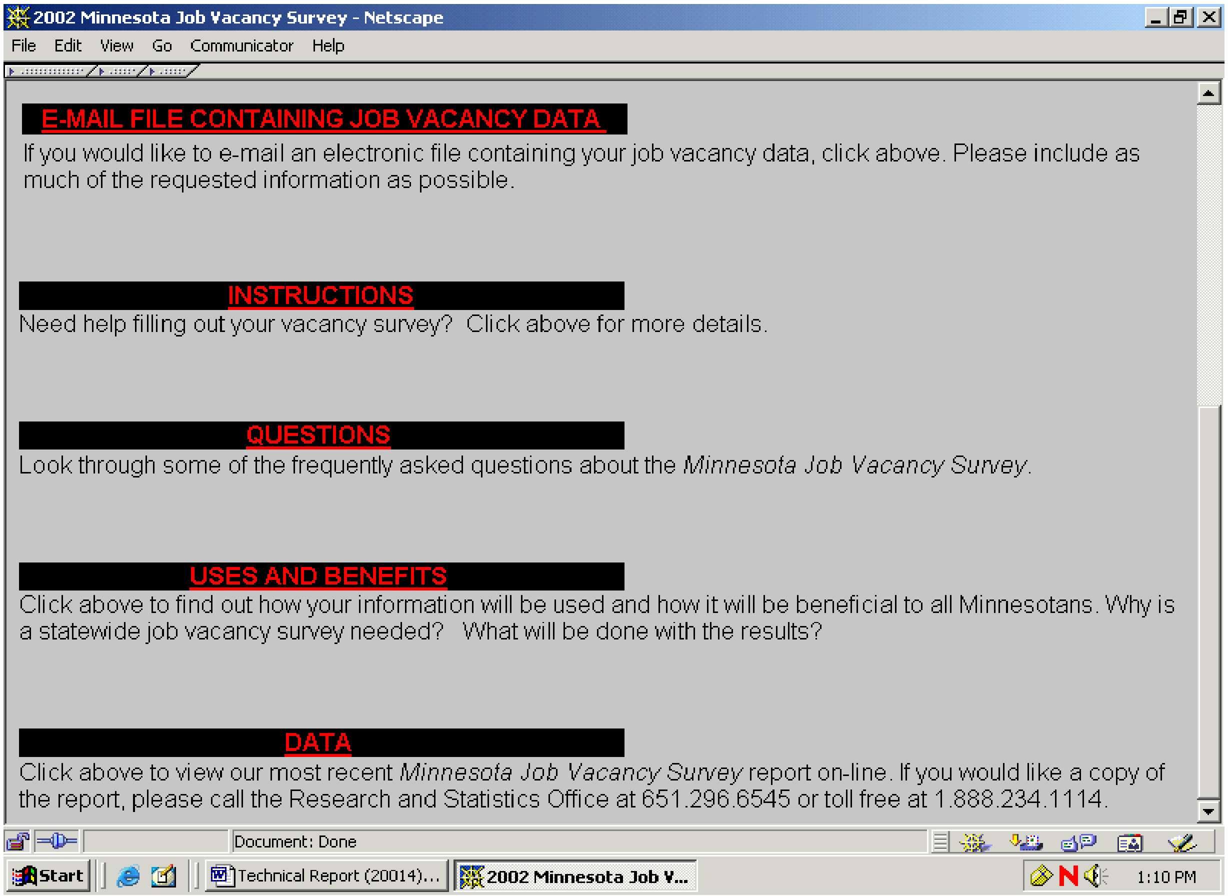
- Printout of job vacancies: A printout of job vacancies can be mailed to the job vacancy survey coordinator.

- Website: Business may offer their website address for job vacancy survey staff members to access job vacancy data. The website should have current and up-to-date information on job vacancies to be the most useful.

The electronic document, hard copy printout, or website alternative are very popular with large employers. Offering these alternatives may increase response rates for medium and large sized employers who have many job vacancies.

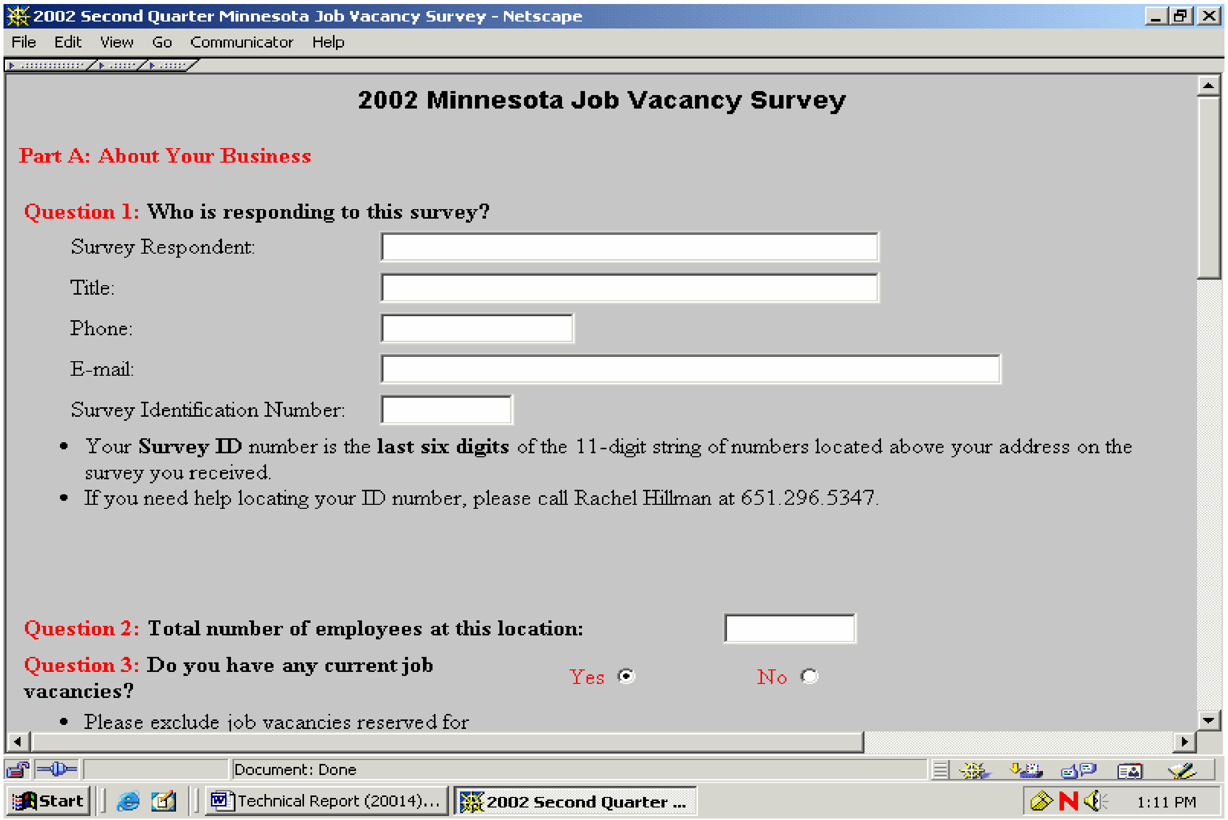
Internet Survey Instrument
Businesses that receive a survey have the option of responding on-line. A main index page briefly describes the job vacancy survey, lists contact information and provides information on frequently asked questions and instructions for completing the on-line survey. On the following page are two screen shots of Minnesota's index page.


2002 Minnesota Job Vacancy Survey - Netscape
File Edit View Go Communicator Help
2002 Minnesota Job Vacancy Survey
In the fourth quarter (October to December) of 2001 we estimated 80,000 job vacancies in Minnesota! This was 43 percent fewer job vacancies than one year ago.
Below you'll find methods for submitting your job vacancy data, general information about the upcoming survey, instructions for filling out the survey and a link to our most recent job vacancy survey report.
If you have any further questions, please contact:
Rachel Hillman at 651.296.5347 or rachel.hillman@state.mn.us
Callers outside the metro area may call our Job Vacancy Survey hotline toll free, 1-877-396-6381.
FILL OUT SURVEY ON-LINE
If you would like to answer your job vacancy survey on-line and submit it via the internet, click on the link above.
E-MAIL FILE CONTAINING JOB VACANCY DATA
If you would like to e-mail an electronic file containing your job vacancy data, click above. Please include as much of the requested information as possible.
Document: Done
Start
Technical Report (20014)...
2002 Minnesota Job V...
1:09 PM



The website has the following components:

- An on-line survey form which closely resembles the survey instrument.
- A link by which a survey respondent can e-mail a file containing their firm's job vacancy data.
- A list of instructions for completing the on-line job vacancy survey.
- A list of frequently asked questions about the job vacancy survey.
- The uses and purpose of a job vacancy survey.
- A link to the most recent job vacancy survey on-line report.



2002 Second Quarter Minnesota Job Vacancy Survey - Netscape

File Edit View Go Communicator Help

2002 Minnesota Job Vacancy Survey

Part A: About Your Business

Question 1: Who is responding to this survey?

Survey Respondent:

Title:

Phone:

E-mail:

Survey Identification Number:

- Your **Survey ID** number is the **last six digits** of the 11-digit string of numbers located above your address on the survey you received.
- If you need help locating your ID number, please call Rachel Hillman at 651.296.5347.

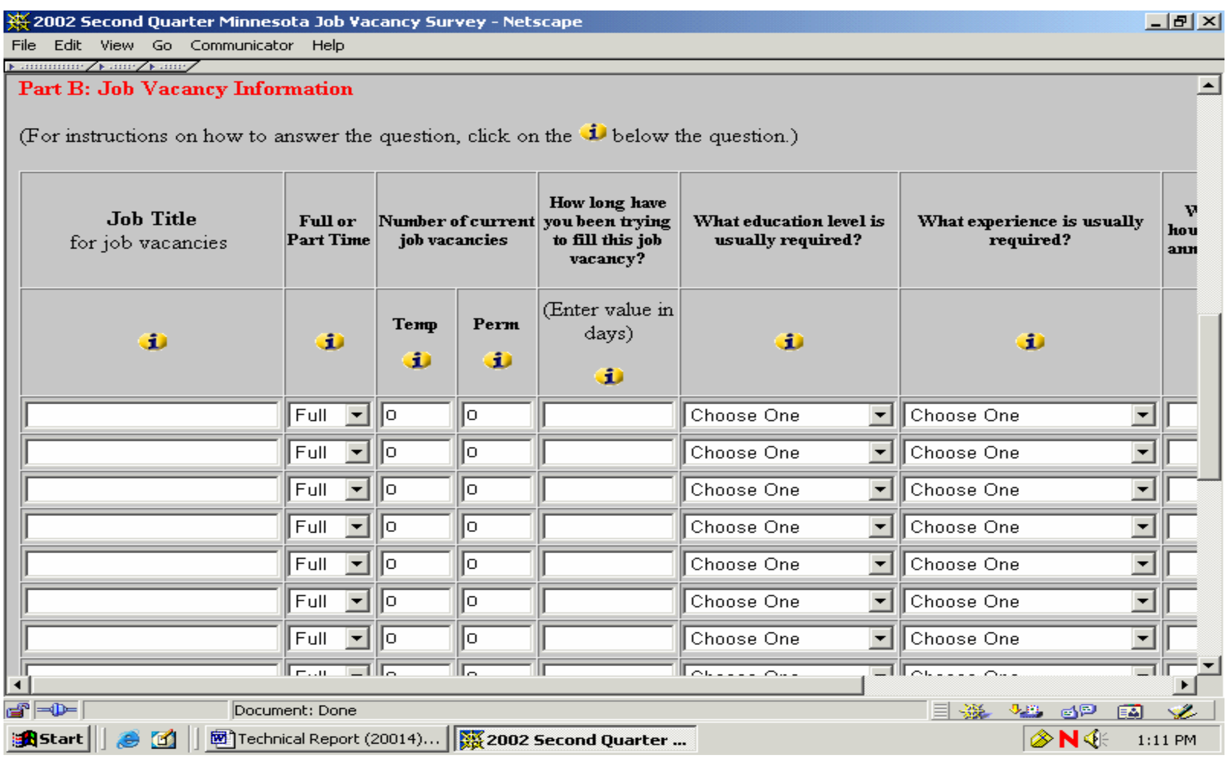
Question 2: Total number of employees at this location:

Question 3: Do you have any current job vacancies? Yes No

- Please exclude job vacancies reserved for

Document: Done

Start | Technical Report (20014)... | 2002 Second Quarter ... 1:11 PM



2002 Second Quarter Minnesota Job Vacancy Survey - Netscape

File Edit View Go Communicator Help

Part B: Job Vacancy Information

(For instructions on how to answer the question, click on the below the question.)

Job Title for job vacancies	Full or Part Time	Number of current job vacancies		How long have you been trying to fill this job vacancy?	What education level is usually required?	What experience is usually required?	W hou ann
		Temp	Perm	(Enter value in days)			
	Full	0	0		Choose One	Choose One	
	Full	0	0		Choose One	Choose One	
	Full	0	0		Choose One	Choose One	
	Full	0	0		Choose One	Choose One	
	Full	0	0		Choose One	Choose One	
	Full	0	0		Choose One	Choose One	
	Full	0	0		Choose One	Choose One	

Document: Done

Start | Technical Report (20014)... | 2002 Second Quarter ... 1:11 PM

Telephone Survey

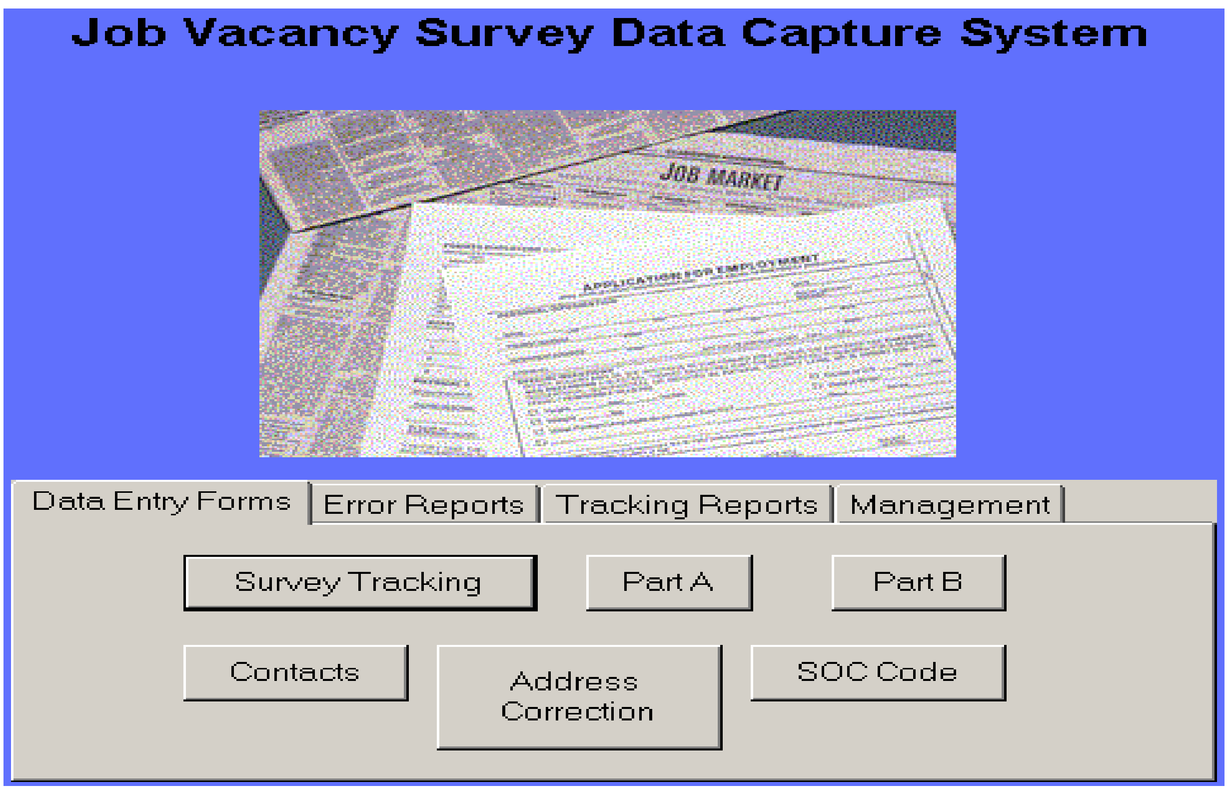
An alternative to a mail survey is a telephone survey. Colorado conducts the job vacancy survey by telephone and has the infrastructure to take outside contracts to perform this service for other states. The cost of conducting a survey by phone is about $20.00 per completed response. Please contact Alexandra Hall, Director, Colorado Labor Market Information Office, for more information about this option.

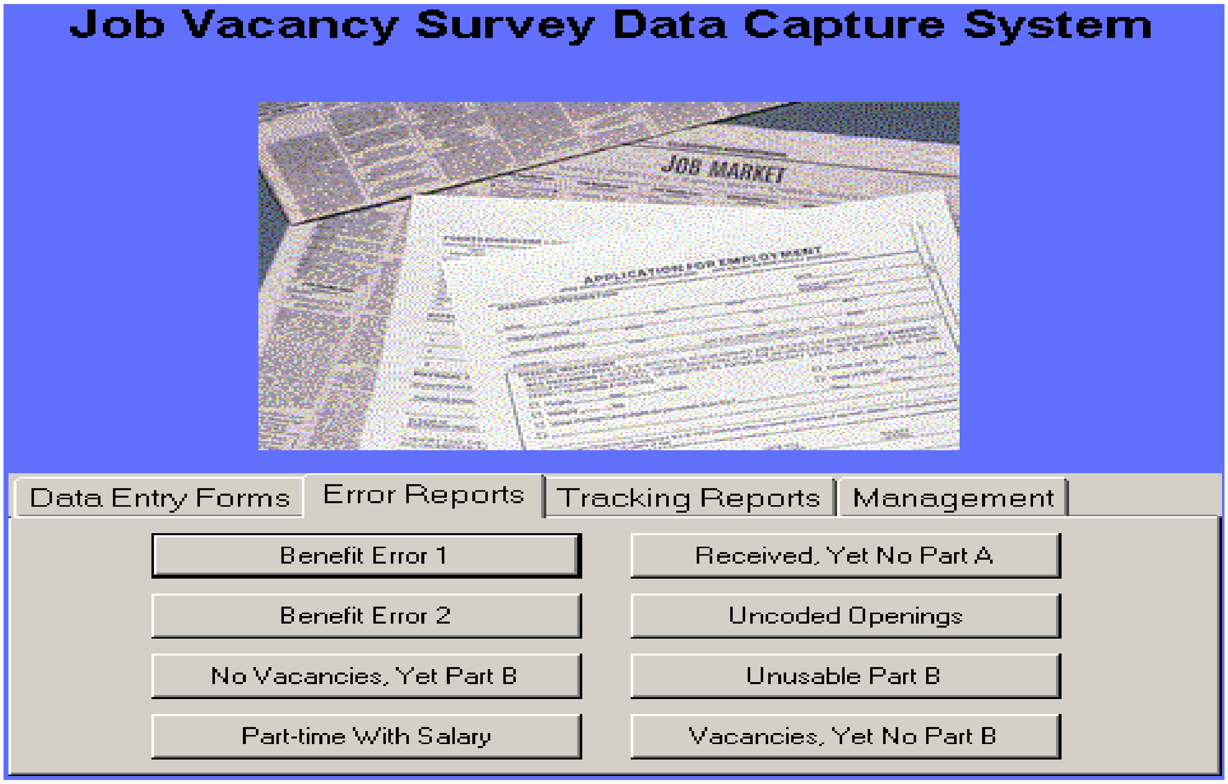
Data Capture System

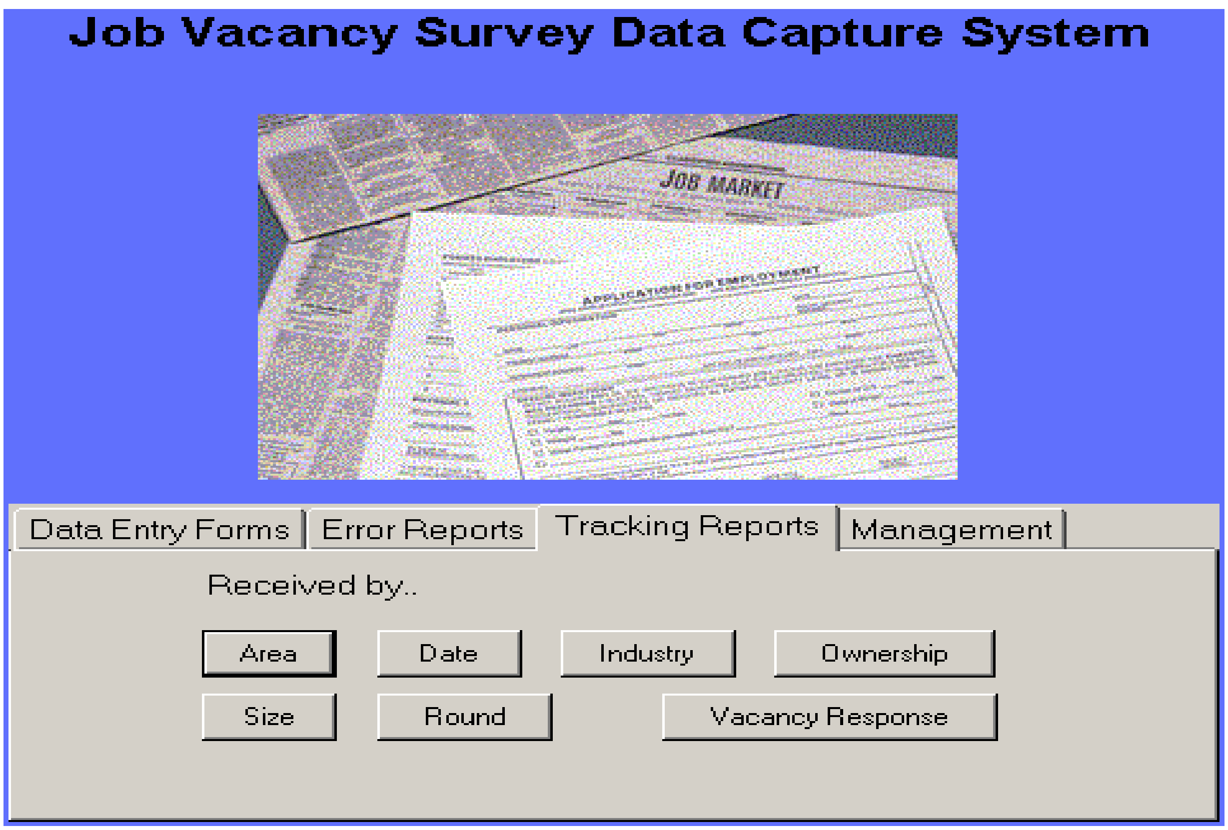
The JVS Data Capture System (DCS) is designed to take the sample generated by the JVSSASS and allow the user to enter job vacancy survey data for that sample. In addition, the DCS has error identification and survey tracking reports; address correction, contact, and Standard Occupational Classification (SOC) coding forms; and management tools. The DCS is also designed to allow for easy transfer of data to the JVS Estimation Software upon completion of the survey.

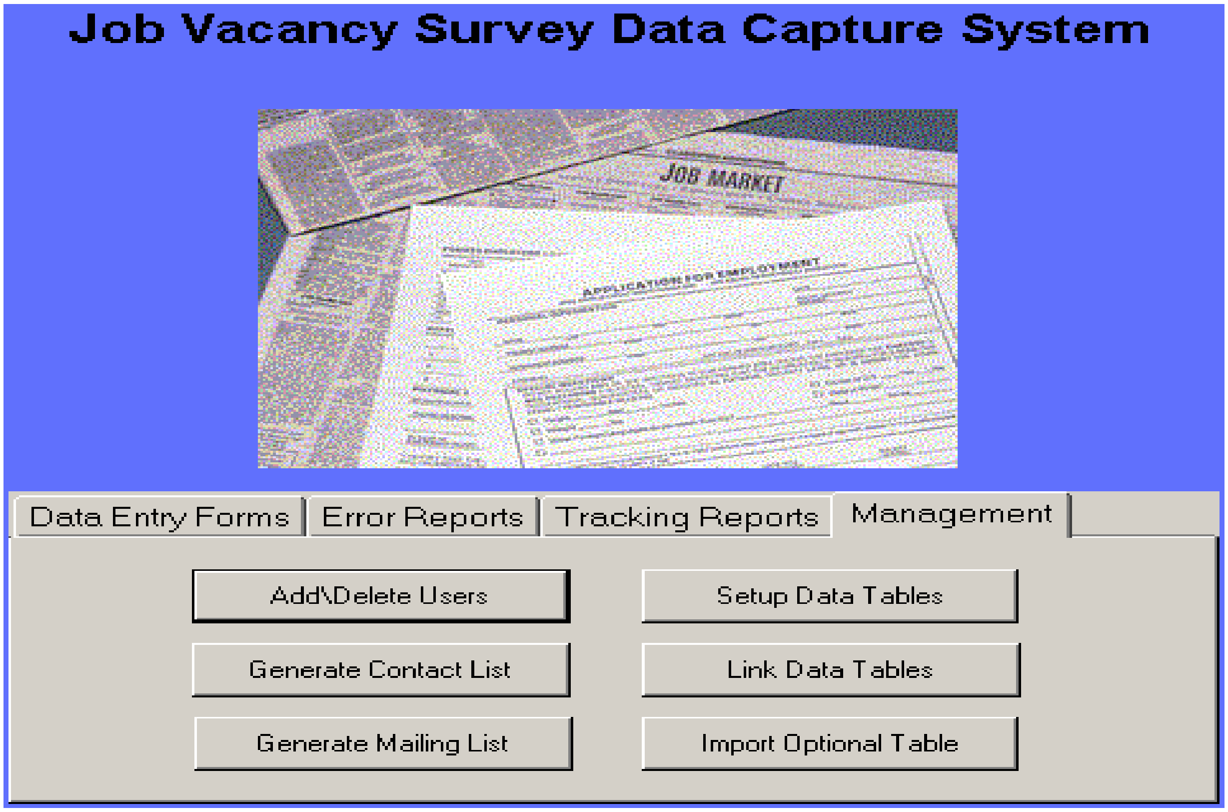
The following screen shots display forms that users can use to navigate the system and enter data.

- These screen shots are of the four switchboard tabs. The switchboard allows users to navigate to the data entry forms, the error reports, the tracking reports, and the management tools.

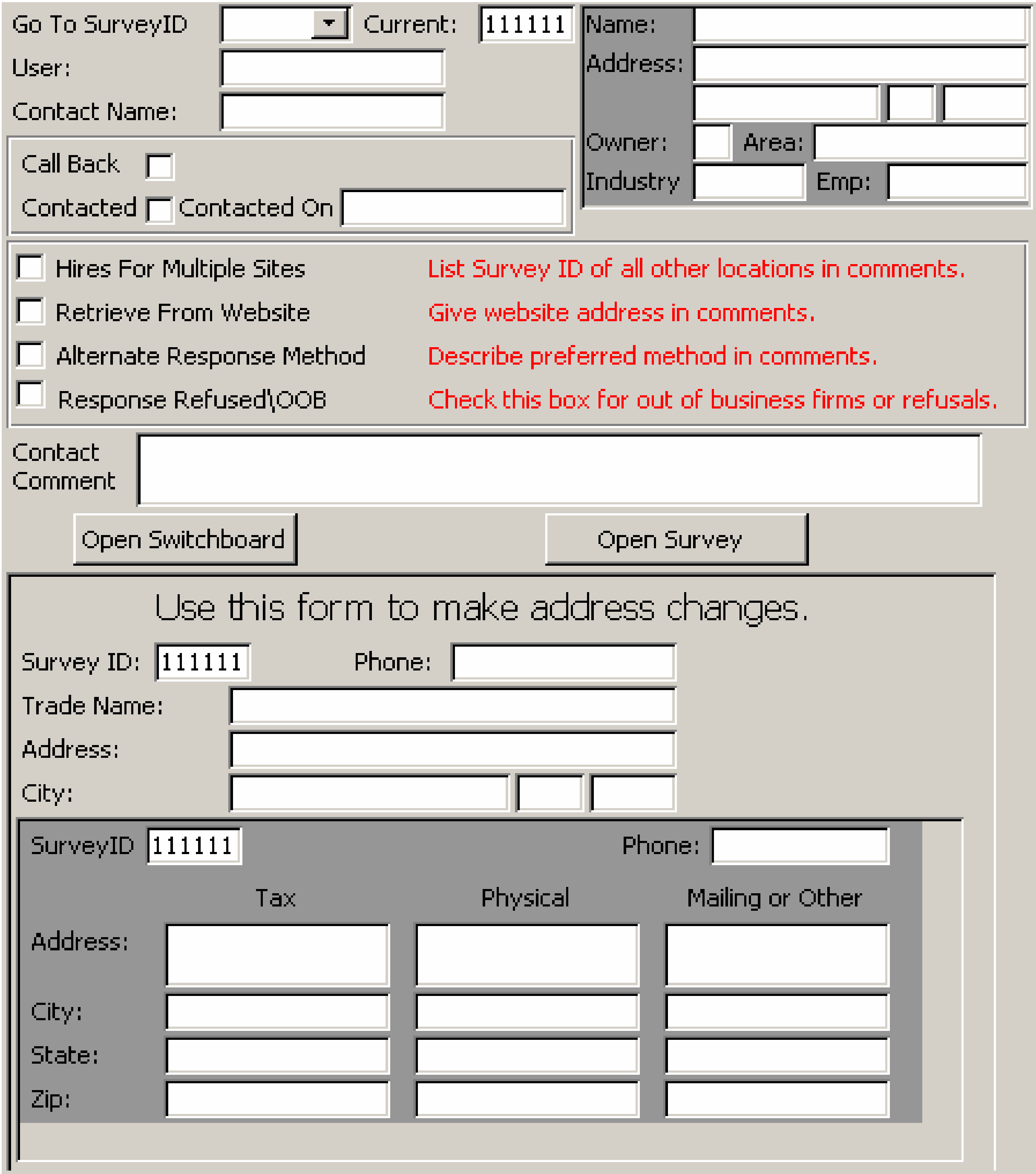



Job Vacancy Survey Data Capture System
JOB MARKET
APPLICATION FOR EMPLOYMENT
Data Entry Forms
Error Reports
Tracking Reports
Management
Benefit Error 1
Benefit Error 2
No Vacancies, Yet Part B
Part-time With Salary
Received, Yet No Part A
Uncoded Openings
Unusable Part B
Vacancies, Yet No Part B

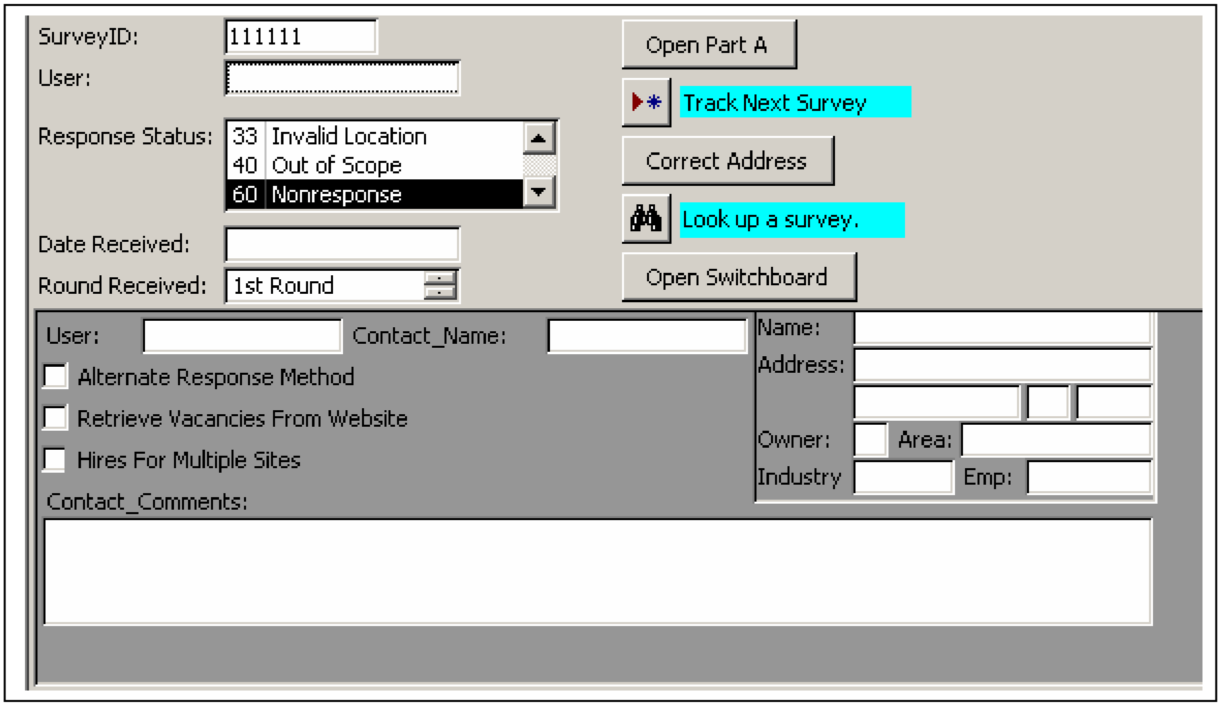

Job Vacancy Survey Data Capture System
JOB MARKET
APPLICATION FOR EMPLOYMENT
Data Entry Forms
Error Reports
Tracking Reports
Management
Received by..
Area
Date
Industry
Ownership
Size
Round
Vacancy Response



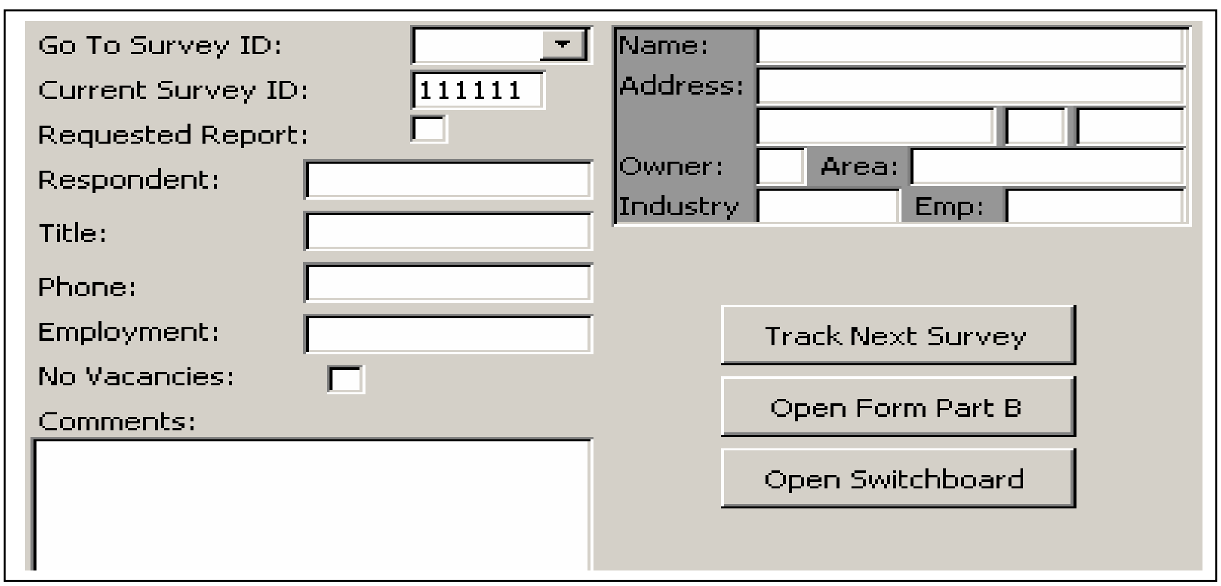
- The contact form is used for keeping a record of contact information and information garnered from the contact. This form also includes the address correction form as a sub-form. The address correction form is also an independent form that has its own navigation buttons.



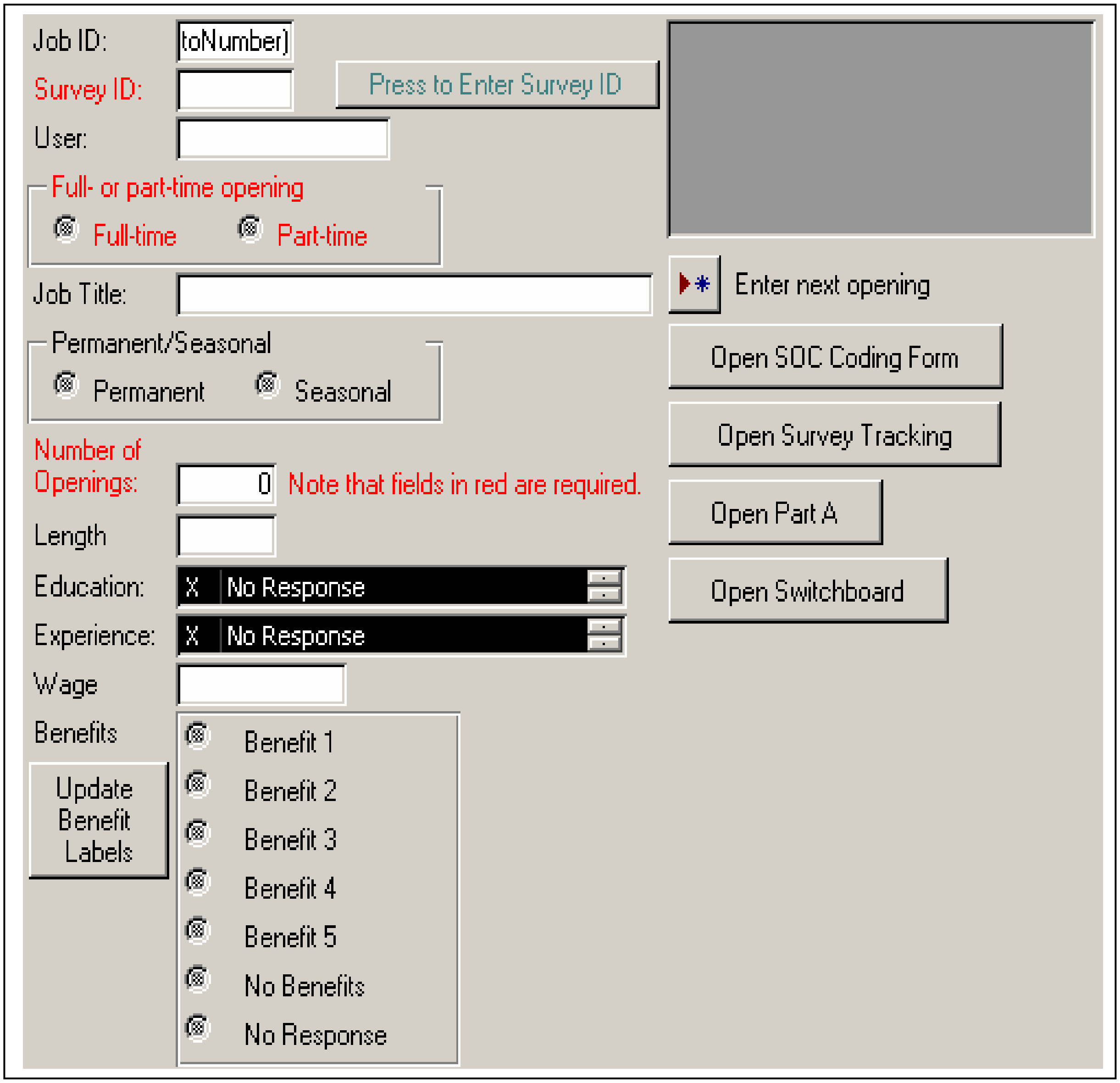
- The survey tracking form is used to log the receipt of a returned survey.



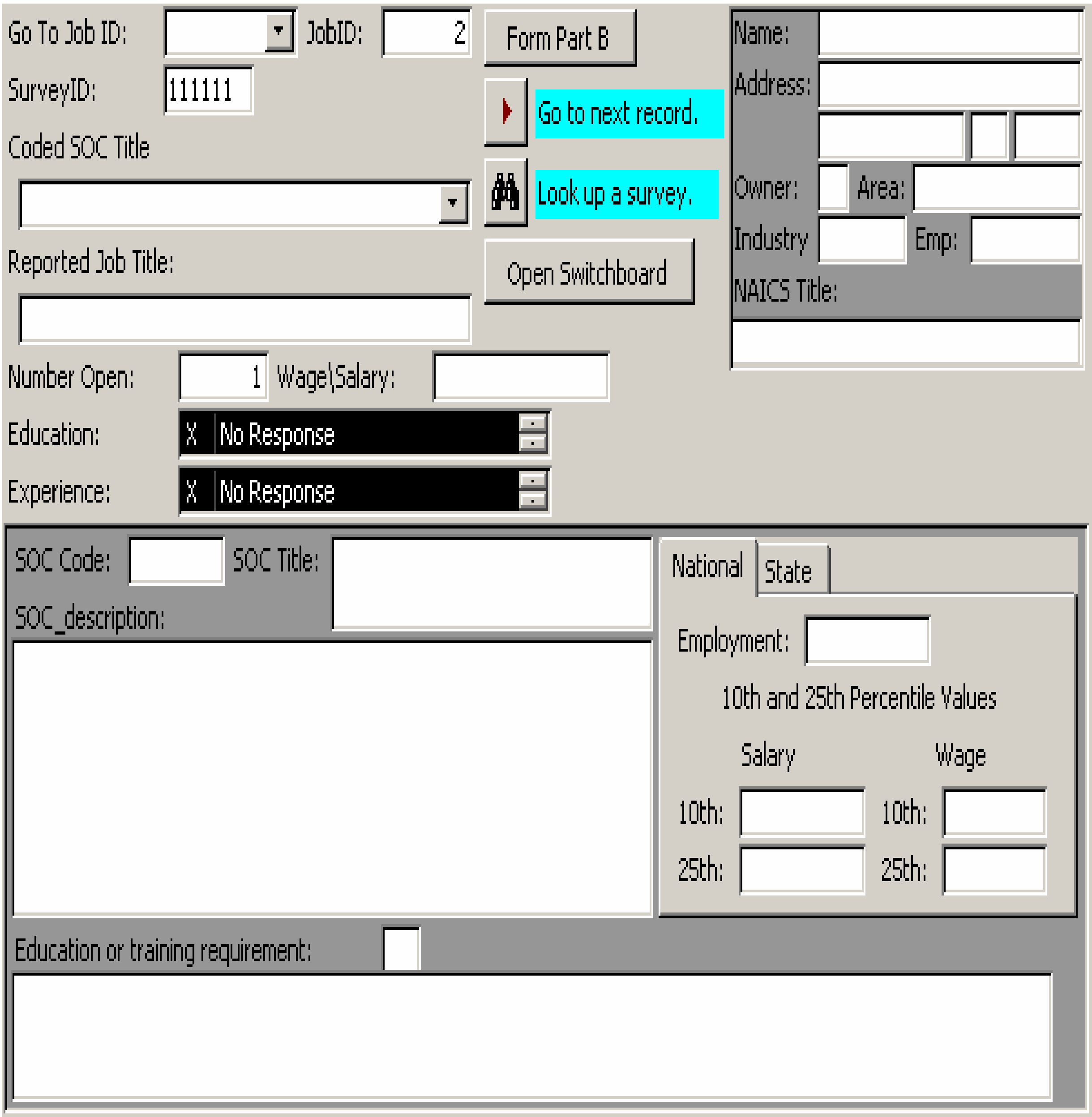
- The Part A data entry form is used to input the data from the Part A portion of the survey. (This corresponds to the front side of survey instrument.)



- The Part B data form is used to input the data from the Part B portion of the survey. (This corresponds to the back side of the survey instrument.)



- The SOC coding form is used to give an occupational code to the job title that was recorded in Part B.



Matching Job Titles to the Standard Occupational Classification (SOC) System

Employers provided numerous specific job titles. Analysts reviewed these job titles and matched them to the Standard Occupational Classification (SOC) titles. The 1998 SOC structure used in this study is a set of six-digit occupational codes that is currently being used by a number of different agencies, including the BLS and the Bureau of the Census, to categorize occupations. SOC is an updated occupational classification system that replaces the Occupational Employment Statistics (OES) system.

The SOC is a four-tiered structure with 820 detailed six-digit occupations that can be summarized into 450 broad four-digit occupations, 98 minor three-digit occupational groups, and 23 two-digit major occupational groupings. For the purpose of this study, occupational information is presented at both the major and detailed occupational levels.

To minimize coding error, analysts created a database of over 26,000 alternative job titles that were linked to the 820 detailed six-digit occupational codes. In matching employer job titles to SOC six-digit codes, analysts were careful to match vague titles, such as "installer" to appropriate codes by contacting employers or examining detailed employer information. Indistinct titles that could not be linked to a specific SOC code, mainly due to lack of job and employer information, were placed in a more general occupational category.

Below is a list of the 22 occupational groups:

Major Occupational Group*	**Sample Occupations**
Management	Financial Managers, Marketing and Sales Managers, Funeral Directors, and Educational Administrators.
Business and Financial Operations	Accountants, Human Resource Specialists, Actuaries, Mathematicians, and Computer Specialists.
Computer and Mathematical	Computer Programmers, Software Engineers, Electrical Engineers, Drafters, and Mechanical Engineering Technicians.
Architecture and Engineering	Architects, Surveyors, Chemical Engineers, Electrical Engineers, Drafters, and Mechanical Engineering Technicians
Life, Physical and Social Sciences	Animal Scientists, Biologists, Astronomers, Chemists, Sociologists, Market Survey Analysts, and Forensic Science Technicians.
Community and Social Services	Marriage and Family Therapists, Social Workers, Health Educators, Clergy, and Religious Workers.
Legal	Lawyers, Judges, Paralegal and Legal Assistants, Court Reporters and Title Examiners, Abstractors, and Searchers.
Education, Training and Library	Post-secondary Teachers, Kindergarten Teachers, Secondary School Teachers, Special Education Teachers, Librarians, and Teaching Assistants.
Art, Design, Entertainment, Sports, and Media	Fine Artists, Actors, Producers and Directors, Coaches, Public Relations Specialists, and Radio

	Operators.
Healthcare Practitioners and Technicians	Chiropractors, Dentists, Pharmacists, Physicians, Registered Nurses, Occupational Therapists, Paramedics, and Surgical Technologists.
Healthcare Support	Home Health Aides, Massage Therapists, Dental Assistants, and Medical Transcriptionists
Protective Service	Fire Fighters, Police Detectives, Fish and Game Wardens, Animal Control Workers, and Security Guards.
Food Preparation and Serving Related	Food Preparation Managers, Cooks, Food Preparation Workers, Bartenders, Waiters and Waitresses, Dishwashers, and Hosts and Hostesses.
Building and Grounds Cleaning and Maintenance	Building and Maintenance Managers, Janitors, Maids and Housekeeping Cleaners, Pest Control Workers and Tree Trimmers and Pruners.
Personal Care and Service	Animal Trainers, Ushers, Lobby Attendants, Ticket Takers, Barbers, Flight Attendants, Child Care Workers, and Fitness Trainers.
Sales and Related	Cashiers, Retail Salespersons, Insurance Sales Agents, Models, Real Estate Agents, and Travel Agents.
Office and Administrative Support	Office Manager, Bill and Account Collectors, Tellers, File Clerks, Customer Service Representatives, Secretaries, Word Processors, and Typists.
Farming, Fishing, and Forestry	Farmers, Animal Breeders, Hunters and Trappers, Agricultural Inspectors, Logging Equipment Operators, Forest and Conservation Workers.
Construction and Extraction	Carpenters, Construction Laborers, Electricians, Pipelayers, Roofers, Highway Maintenance Workers, Sheet Metal Workers, and Mining Machine Operators.
Installations, Maintenance, and Repair	Radio Mechanics, Automotive Service Technicians and Mechanics, Motorcycles Mechanics, Millwrights, and Medial Equipment Repairers.
Production	Bakers, Butchers and Meat Cutters, Machinists, Foundry Mold and Coremakers, Tool Grinders, Printing Machine Operators, and Medical Appliance Technicians.
Transportation and Material Moving	Airline Pilots, Bus Drivers, Truck Drivers, Parking Lot Attendants, Crane and Tower Operators, Packers and Packagers, and Shuttle Care Operators.

*Excludes military specific occupations.
For more information on the Standard Occupational Classification (SOC) System, see the supplement contained in the December 1999 issue of *Minnesota Employment Review* at: http://www.MnWorkForceCenter.org/lmi/public.htm
or on the SOC Web page: http://stats.bls.gov/soc/soc_home.htm

NAICS Definitions

Additionally, twenty major industries, defined by the 1997 North American Industry Classification System (NAICS) are represented in the survey sample. NAICS is an updated industrial classification system that will be replacing the Standard Industrial Classification (SIC) system. NAICS includes the following industries:

NAICS INDUSTRY	INDUSTRY DESCRIPTION
Agriculture	Firms engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals from a farm, ranch, or their natural habitats.
Mining	Firms that extract naturally occurring mineral solids, such as coal and ores; liquid minerals, such as crude petroleum; and gasses, such as natural gas.
Utilities	Firms engaged in the provision of the following utility services: electric power, natural gas, steam supply, water supply, and sewage removal.
Construction	Firms engaged in the construction of buildings and other structures, heavy construction, additions, alterations, reconstruction, installations, and maintenance and repairs.
Manufacturing	Firms engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products.
Wholesale Trade	Firms engaged in wholesale merchandising, generally without transformation, and rendering services incidental to the sale of merchandise.
Retail Trade	Firms engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.
Transportation and Warehousing	Firms engaged in the transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation.
Information	Firms engaged in the production, processing and distribution of information and cultural products.
Finance and Insurance	Firms engaged in financial transactions (including the creation, liquidation, or change in ownership of financial assets) and/or facilitating financial transactions.

Real Estate	Firms engaged in renting, leasing, or otherwise allowing for the use of tangible or intangible assets, and establishments providing related service.
Technical Services	Firms specializing in performing professional, scientific, and technical activities for others.
Management	Firms who hold the securities of companies and enterprises for the purpose of controlling interest or influencing management decisions or who administer, oversee, and manage the company in a strategic, organizational or decision-making role.
Administrative and Support	Firms providing routine support activities for the day-to-day operations of other organizations.
Educational Services	Firms providing instruction and training on a wide variety of subjects.
Healthcare	Firms providing healthcare and social assistance to individuals.
Arts and Entertainment	Firms engaged in providing services to meet the varied cultural, entertainment and recreational interests of their patrons.
Accommodation	Firms providing customers with lodging and/or preparation of meals, snacks and beverages for immediate consumption.
Other Services	Firms engaged in providing services not specifically provided for elsewhere in the classification system.
Public Administration	Federal, state and/or local agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions in a given area.

Source: North American Industry Classification System, United States, 1997.
NAICS Web page: http://www.census.gov/epcd/www/naics.html

Job Vacancy Survey Estimates Production System (JVSEPS)

Methodology
Samples for the job vacancy survey are allocated and selected using standard statistical procedures when the survey practitioner utilizes the allocation software developed by BLS. The sampling system documentation describes how samples may be designed to suit the needs of the locality. In all cases, the samples are weighted to represent the population. These sampling weights are developed and assigned to establishment records by the sampling software, and they play a critical role in the estimation process.

Post survey processes that may be performed on survey data are
- (1) atypical reporter review and adjustment,
- (2) basic data edits,
- (3) identification of outliers,
- (4) accounting for complete unit non-response,
- (5) accounting for partial unit non-response, and
- (6) adjusting total survey weighted values to a population level.

Given the complex nature of the first item, it will be omitted from the software. As time and resources permit, general guidance on this topic will be provided via documentation allowing adjustments to be made to data in the data collection software. Also, given the relatively short survey cycle for the job vacancy survey, we can omit the sixth item from the estimation process. That is, there is no need to ratio-adjust weighted sample employment to known population values. Therefore, the estimation software will include processes for items two, three, four, and five.

The JVSEPS will perform basic data edits, and present a report describing any problems. Basic edits are essentially used to verify that the data extracted from the data collection software have the expected characteristics. Another module in the system will identify potential outliers and prepare a report. The user will be asked to review this report and, if necessary, make corrections to the data using the data capture software.

The estimation software will account for complete unit non-response by utilizing a weighting class adjustment procedure. This procedure will calculate a Non-Response Adjustment Factor (NRAF) and apply this weight adjustment to the responding units. Partial non-response will be accounted for by utilizing a hot-deck nearest-neighbor imputation process.

Implementation

The estimation software is the third in a set of software designed for state utilization for the JVS program. The first in this set is the JVS Sample Allocation and Selection System (JVS-SASS). The second in the set, is the JVS Data Capture System used for the collection and management of survey data. All three of these software work together.

The estimation system will utilize a Graphical User Interface (GUI) developed in Microsoft Access™, while SAS™ version 8 will be utilized in the background for most of the data processing. The State will be required to have SAS™ available on the PC [1] where the software will reside. The State will not be required to purchase an additional MS Access™ license to utilize the software. The State analyst will not need to know MS Access™ or SAS™ to run the estimation system [2]. The GUI will facilitate the editing of a number of databases that are peripheral to the job vacancy survey data. The GUI will allow, for example, a user to enter occupational employment totals -- obtained from some other source -- into a database for use in the calculation of occupational vacancy rates. Similarly, a user will be able to enter occupational turnover rates -- obtained from some other source -- into a database for use in the calculation of turnover-adjusted demand (TAD). If the State is not interested in these particular statistics the databases can be ignored.

The estimation system will allow the user to define the level of estimation based on Geography, Industry, Employment Size Class, Ownership, Job Type [3], Experience, Education, and Occupation. The first four characteristics allow the system to partition the data at the establishment level into discrete, non-overlapping groups Ω_k, while the use of all eight classification variables partitions the data into *estimation cells* Ω_h.

We will utilize the term "*attributes*" to describe the characteristics of a set of estimates produced using a particular set of values for the eight classification variables. For example, the set of characteristics [All Areas, All Industry, All Size, All Ownership, All Job Type, All Experience, All Education, by Major Occupation Group] defines one set of *attributes*. Selecting these *attributes* would return a set of estimates with one row (of statistics) for each Major Occupation Group. The system as planned will be versatile enough to allow the user to produce estimates based on many different sets of *attributes*. In fact, the system will allow the user to produce estimates based on over 4,000 different *attribute* sets. The user will clearly want to select a small subset of these that conform to the sample design and their particular estimation requirements.

The system will also allow the user to design a number of report formats to use to print tables from a set of estimates based on a single set of *attributes*. Continuing the example above, the user may want

- a table listing the vacancies for the major occupation groups,

---

[1] Plans for system testing will include both MS Windows™ NT 4.0 and MS Windows™ 95
[2] We will assume that all users are familiar with MS Windows™ basics; menu navigation, the mouse, etc.
[3] Permanent or Temporary/Seasonal

- a separate table listing the Proportion of Vacancies that are Permanent (for each of the major occupation groups),
- a separate table listing the mean wage of vacancies (for each of the major occupation groups), and
- a separate table listing the mean wage of vacancies, the proportion of vacancies always open, and the proportion of vacancies requiring no diploma (for each of the major occupation groups).

The following statistics will be available for each set of estimates based on a particular set of *attributes*. The user will be able to select among these statistics when generating tables for a report.

Classification Values for Attributes Ω_h:
Geography
Industry
Employment Size Class
Ownership
Job Type
Experience
Education
Occupation

Values calculated for Ω_k: (for all units with the characteristics defined by Ω_k)
Total Employment
Total Vacancies
Total Vacancy Rate
Population Units
Reporting Units

Values calculated for Ω_h: (for all occupations with the characteristics defined by Ω_h)

General
Number of sampled establishments reporting the occupation(1)
Estimated occupational vacancies
Occupational employment(2)
Occupational vacancy rate(2)
Turnover-adjusted demand(2)

Job Type
Proportion of Vacancies that are Permanent
Proportion of vacancies that are Temporary/
Seasonal

Duration of a Job Vacancy
Proportion of Vacancies Open Less Than 30 Days

Proportion of Vacancies Open between 30 Days and 60 Days
Proportion of Vacancies Open More than 60 Days
Proportion of Vacancies Always Open

Education and Experience
Proportion of Vacancies Having No Education Requirement
Proportion of Vacancies Requiring HS/GED
Proportion of Vacancies Requiring Vocational Education
Proportion of Vacancies Requiring an Associate’s degree
Proportion of Vacancies Requiring a Bachelor's degree
Proportion of Vacancies Requiring an Advanced degree
Proportion of Vacancies Requiring No Experience
Proportion of Vacancies Requiring Work Experience
Proportion of Vacancies Requiring Related Experience
Proportion of Vacancies Requiring Occupational Experience

Wages
Mean Wage for Vacancies
Minimum Wage Rate
Maximum Wage Rate

Benefits
Proportion of Vacancies with Benefit 1
Proportion of Vacancies with Benefit 2
Proportion of Vacancies with Benefit 3
Proportion of Vacancies with Benefit 4
Proportion of Vacancies with Benefit 5
Proportion of Vacancies with No Benefit

Confidentiality Flag

[1]That possesses the characteristic at the estimating level—not weighted.

[2] These statistics will only be available if other data sources are used to supply estimates of occupational employment and turnover.

The JVSEPS software is being designed as a versatile estimation and reporting tool with the requirements of many users in mind. Using the JVS-SASS, the JVS-DCS, and this estimation software will allow localities to produce high quality job vacancy survey estimates.

Workforce Supply and Demand Indicators

Counts of current job vacancies are an easily understood measure of employment opportunity and hiring demand. However, job vacancy counts alone do not provide a complete picture of market demand, supply and shortages. This report describes three measures for the comparison of hiring demand across occupation groups and industries: job vacancy rate, length of time positions are open, and turnover-adjusted demand.

Job Vacancy Rate

The job vacancy rate represents the number of job vacancies for every 100 filled jobs (total employment) in an occupation group, industry, or region. The job vacancy survey is a point-in-time survey so the vacancy rates are point-in-time estimates rather than quarterly counts. In other words, they cannot be added together for an annual total.

The job vacancy rate is calculated using simple division.

- For the numerator, the number of job vacancies is estimated from the job vacancy survey, utilizing the scaling and imputation methods described above.
- For the denominator, total employment is estimated from a state's Occupational Employment Statistics (OES) survey, using the Estimates Delivery System (EDS) to generate regional occupational estimates customized for the regions used in the job vacancy survey. (See Occupational Employment Estimates below for more information.)

Job vacancy rates can be calculated for the 22 major occupational groups (2-digit SOC), specific occupations (6-digit SOC), 20 major NAICS industry groups (2-digit NAICS), and by MSA or aggregates of MSAs.

Rates for the more aggregated major occupation groups are likely to be more reliable for two reasons. First, data on specific occupations are reported in very small numbers for most occupations so estimates are more likely to be unreliable. Second, there is less possibility for error when assessing and coding the major occupation group than in coding the specific occupation. Both of these issues are concerns due to the separate survey methods and estimation processes of job vacancy surveys and the OES Survey.

Duration of Job Vacancies

Employers are asked how long current job vacancies have been open-for-hire. Respondents may respond that the positions at issue are open "less than 30 days", "30 to 59 days", "60 or more days" or that they are "always open."

Statistics on "time-open" can be considered an indicator of hiring difficulty. In fields that are well-supplied with qualified, interested workers, job vacancies can be filled quickly. Where shortages exist, job vacancies are likely to remain vacant and open for hire longer.

Unfortunately it is not straightforward to interpret data on the duration of vacancies. Hiring practices can be substantially different from one field to another; for example the time firms spend hiring a university professor, a highly skilled programmer, or a CEO is substantially longer, for the most part, than the time spent hiring wait staff or retail clerks. "Always open" generally indicates that an occupation has high turnover and that as positions are filled, other staff are leaving making hiring a continuous need. Finally, occupations with long hiring cycles – or substantial numbers of "always open" positions – are likely to be over-represented in comparisons of numbers of job vacancies. Meanwhile, fields with short hiring cycles may be under-represented.

The job vacancy survey is not designed to total annual hiring requirements. Statistics on time-open are, again, a reminder that job vacancy counts alone do not provide a complete picture.

Turnover-Adjusted Demand

Many readers are interested in indicators of workforce shortage conditions — that is, an imbalance between workforce supply and demand. However, job vacancy rates alone are inconclusive. As discussed above, various factors influence the number of job vacancies open at a point-in-time.

The major factor distorting the distribution of current job vacancies is turnover — the rate at which workers cycle in and out of jobs. In high-turnover fields, many workers leave their jobs over the course of a year. Simply to maintain staffing, employers recruit and hire continuously. As a result, high-turnover fields such as food service, retail sales, and personal care and service typically have the highest job vacancy rates.

To assess the "real" balance (or imbalance) of supply and demand then, an adjustment for turnover is necessary. This measure, the turnover-adjusted demand, compares job vacancy rates while controlling for typical levels of hiring and separations. The measure can be interpreted as the relative, unmet demand for new entries into the field.

Turnover-adjusted demand is calculated as:
(Job Vacancy Rate for the occupational group/Job Vacancy Rate for all jobs)
divided by
(Turnover rate for the occupational group/Turnover Rate for all jobs)

The result is an index where the average for all jobs (in all occupations) is 1.00.

Turnover Rates

Turnover rates were calculated using the Current Population Survey's Job Tenure Supplement microdata, produced by the US Census Bureau. To start, year 2000 microdata for the complete national sample was downloaded. Census occupation classifications were recoded into 2-digit SOC major occupation groups. Job tenure was recoded to a binary variable: "0" for less than one year of tenure (a new worker), "1" for one year or longer. Next, the share of new workers was calculated for every major occupation group; values can range from 0 percent to 100 percent (1.00). Finally, turnover rates were estimated from the new-worker rates. Assuming that positions could "turnover" more than once over the course of a year – possibly several times – the turnover rate was calculated as:

$$TR = NWR + (NWR)^2 + ½*(NWR)^3 + ½*(NWR)^4 + ½*(NWR)^5$$

where NWR = new worker rate.

The result is a turnover rate that is greater than the new worker rate. Below is the table of new worker rates and turnover rates used in calculating turnover adjusted demand.

	New Worker Rate	Turnover Rate
35 Food Preparation and Serving	40.9%	63.1%
39 Personal Care and Service	34.1%	48.7%
53 Transportation and Material Moving	28.5%	38.3%
41 Sales and Related	27.7%	36.7%
31 Healthcare Support	26.7%	35.0%
47 Construction and Extraction	26.3%	34.5%
37 Building and Grounds Maintenance	26.0%	33.9%
45 Farming, Fishing and Forestry	24.2%	30.9%
27 Art, Design, Entertainment, Media	23.8%	30.3%
43 Office and Administration Support	23.3%	29.6%
15 Computer and Mathematical	20.7%	25.5%
13 Business and Financial Operations	20.2%	24.8%
23 Legal	19.8%	24.2%
51 Production	19.3%	23.4%
19 Life, Physical and Social Science	18.4%	22.2%
25 Education, Training and Library	18.0%	21.5%
49 Installation, Maintenance and	17.4%	20.7%

	Repair		
33	Protective Service	16.9%	20.0%
21	Community and Social Services	15.9%	18.7%
29	Healthcare Practitioners and Technical	15.5%	18.2%
17	Architecture and Engineering	14.7%	17.0%
11	Management	13.0%	14.8%
	ALL OCCUPATIONS	22.4%	28.2%

Alternate Methods of Calculating Turnover Rates

We have investigated alternative measures of calculating turnover rates. However, we have not found a measure that meets the need of producing turnover rates for occupational groups and occupations based on the SOC coding structure or industries based on the NAICS coding structure.

The following is a list of sources for which turnover rates may be calculated and the limitation of each data source:

- Employment Projections produces a national turnover rate based on projected employment growth and job replacement rates for SIC coded occupations.
- Wage Detail produces new hire rates for SIC coded industries.
- The Job Openings and Labor Turnover Survey (JOLTS), under development by the Bureau of Labor Statistics, currently collects industry-specific data based on the SIC coding system.

Occupational Employment Estimates

In order to calculate job vacancy rates and turnover-adjusted demand, employment estimates by occupation are needed. The EDS 2000 is designed to provide occupational employment estimates for local areas by industry as well as employment web pages using results of the annual OES.. EDS is particularly useful because it has allowed for the calculation of employment within occupational groups and detailed occupations for user-defined areas such as the state, Greater Minnesota, and the Twin Cities seven-county metropolitan area. However, it should be noted that OES is designed to produce estimates of occupation by MSA. Therefore estimates for regions other than MSAs or states may not be statistically valid.

Seasonality — Minnesota's Experience

Most economic data produced monthly and quarterly or biannually including job vacancy statistics, are somewhat obscured by regularly-occurring seasonal events such as changes in the weather, opening and closing of schools or major holidays. For example, in the Minnesota climate employment and hiring in construction typically drop in winter and pick up again in spring; all over the country, hiring in retail trade usually picks up in November in time for the holiday shopping season.

If these shifts are a usual seasonal phenomenon, how do we know if a given increase in construction or retail employment is higher or lower than the "normal" seasonal increase that takes place every year? Removing or neutralizing these regularly-occurring increases or decreases during a given month results in "smoothed" data that provide a better perspective from which to judge the true magnitude of the over-the-month or over-the-quarter changes. These modified data are known as seasonally adjusted data.

Seasonality may have an impact on the results of job vacancy surveys. Employers may hire for certain jobs at certain times of the year; hence, responses to questions about hiring will vary depending on when the questions are asked.

At the moment, it is impossible to seasonally adjust job vacancy data. So far, the *Minnesota Job Vacancy Survey* has been conducted four times: once in 2000, twice in 2001 and once in 2002. Other states, with other patterns of seasonality do not have any job vacancy data yet. With data for only a short period in one state— we do not yet have enough information to separate out the impact of regularly-occurring seasonal changes in job vacancies from the impact of shifts in the economy (such as recessions). However, we can use the Minnesota data to begin to speculate on the effect of seasonality on job vacancies.

In Minnesota, job vacancies declined by 21 percent between fourth quarter 2000 and second quarter 2001, and by another 28 percent between second quarter 2001 and fourth quarter 2001. Much of that decline can be attributed to the economic slowdown which hit the state and the nation at the end of 2000 and the beginning of 2001.

However, pulling this drop in vacancies apart by occupation, we find that the number of job vacancies declined at a slower rate or *increased* between fourth quarter 2000 and second quarter 2001 as compared to its behavior between the second quarter 2001 and fourth quarter 2001. We see this trend in these occupation groups:

- Food Preparation and Serving Related
- Office and Administrative Support
- Transportation and Material Moving
- Education, Training and Library
- Healthcare Support
- Personal Care and Services
- Construction and Extraction
- Building, Grounds Cleaning and Maintenance
- Management
- Farming, Fishing and Forestry
- Life, Physical and Social Sciences

It is likely that, while the economic slowdown did depress hiring, the hiring cycle for many of these occupations, including transportation and material moving; education, training and library; building, grounds cleaning and maintenance; and farming, fishing and forestry, is such that the bulk of the hiring is done in the late winter and spring months of the year. So, these occupations had a better showing during spring quarter 2001 than during winter quarter 2001.

On the other hand, the following occupations appeared to have more vacancies during the fourth quarter of 2001 than during the second quarter of 2001, with vacancies either declining at a slower rate or actually *increasing* during the last quarter of the year:

- Sales and Related
- Healthcare Practitioners and Technical
- Production
- Business and Financial Operations
- Installation, Maintenance and Repair
- Community and Social Services
- Architecture and Engineering
- Protective Services
- Computer and Mathematical
- Legal

Except for sales and related (hiring in preparation for the holiday season), the role of seasonality is less obvious in this list. Instead, one-time events and the economic cycle may be playing a role here. Hiring in protective services, for example, may have been impacted by the events of September 11th, and hiring in community and social services may be on the rise due to the high number of layoffs and resulting need for social services in Minnesota.

Another interesting piece of information that the job vacancy survey provides on seasonality is the number of open-for-hire positions that employers report as seasonal or temporary. Overall, an estimated 18 percent of all fourth quarter 2001 job vacancies were temporary or seasonal jobs. This number of vacancies— 14,600 vacancies— is down from 15 percent of all job vacancies one year earlier and 16 percent of all job vacancies two quarters (second quarter 2001) earlier. Again, an examination of the occupational distribution of these seasonal or temporary jobs can help us think about the role of seasonality in job vacancy counts.

Table 1 lists job vacancies in Minnesota by major occupational group. Four occupational groups may begin to show a pattern in the hiring of seasonal or temporary employees. The percent of seasonal vacancies in sales and related during the fourth quarters of 2000 and 2001 was more than twice that of the second quarter 2001. This is undoubtedly in preparation for holiday season shopping. Personal care and services (amusement and recreation accounts for the increase), protective services and legal occupations show the opposite pattern, with a higher proportion of seasonal or temporary open-for-hire positions in the second quarter of 2001 than during the fourth quarters of 2000 or 2001.

Table 1: Job Vacancies by Major Occupational Group in Minnesota

Major Occupational Group	Fourth Quarter 2000 Number Of Job Vacancies	Fourth Quarter 2000 Temporary Or Seasonal (%)	Second Quarter 2001 Number Of Job Vacancies	Second Quarter 2001 Temporary Or Seasonal (%)	Fourth Quarter 2001 Number Of Job Vacancies	Fourth Quarter 2001 Temporary or Seasonal (%)
Food Preparation and Serving Related	16,450	15%	15,276	19%	11,416	8%
Sales and Related	24,544	34	15,401	13	10,862	34
Office and Administrative Support	19,157	13	13,443	7	8,795	28
Healthcare Practitioners and Technical	7,709	1	7,438	1	7,449	3
Transportation and Material Moving	7,524	21	9,032	20	6,050	35
Production	10,977	7	5,607	7	4,734	3
Education, Training and Library	3,035	7	4,964	13	4,404	27
Healthcare Support	5,800	2	5,454	5	4,164	2
Personal Care and Services	5,437	18	6,918	36	3,376	20
Business and Financial Operations	4,157	12	2,148	2	3,112	27
Construction and Extraction	6,404	10	6,405	41	2,396	36

Building, Grounds Cleaning and Maintenance	5,752	26	4,065	44	1,982	8
Installation, Maintenance and Repair	6,473	12	2,682	17	1,976	6
Community and Social Services	2,911	5	1,159	9	1,856	24
Management	3,888	4	3,581	2	1,715	3
Architecture and Engineering	2,637	5	1,312	2	927	2
Farming, Fishing and Forestry	477	37	801	44	923	22
Protective Services	1,379	5	1,029	29	908	5
Art, Design, Entertainment and Media	1,675	12	1,213	14	891	32
Life, Physical and Social Sciences	699	1	785	10	814	6
Computer and Mathematical	2,608	10	1,251	1	704	1
Legal	260	1	288	34	333	1
All Job Vacancies	**139,953**	**15%**	**110,376**	**16%**	**79,787**	**18%**

Finally, some occupational groups had dramatic shifts in their proportion of temporary and seasonal job vacancies that were not expected. By fourth quarter 2001, one-fourth of the business and financial operations and one-third of the art, design, entertainment and media job vacancies were temporary or seasonal. This large increase in the percentage of seasonal job vacancies over the three rounds of the *Minnesota Job Vacancy Survey* is hard to explain and would be even more difficult to predict.

Adjusting for seasonality could help us separate the impacts of economic shifts from seasonal factors influencing job vacancy counts. Until a longer time series in more locations around the U.S. of job vacancy data is available, however, the impact of seasonality remains largely speculative.

Marketing

Customer Feedback
The job vacancy survey is a new product, and as with any new product, marketing is important to building a customer base. We have identified five keys to marketing job vacancy statistics:

- Identify the potential audiences in your state and around the nation.

- Create user friendly paper and web publications oriented toward these audiences and work to make sure they receive them.

- Incorporate findings from the job vacancy survey into the range of information disseminated through your LMI Office (publications, articles, interviews, presentations, training and website).

- Press release new data and findings to the media and provide interviews to help the media interpret this new information.

- Collect and use customer feedback to continuously improve publications and web presence.

The Audience
We have identified the following key user groups of job vacancy information:

- Policy makers include the legislature, governor’s office, Governor’s Workforce Development Council (GWDC), state and local employment, training and welfare policy offices and local elected officials. These groups use JVS information to identify the location and magnitude of labor market imbalances and the quantity and quality of current open-for-hire positions. In Minnesota, we can and do mail directly to the GWDC and state and local policy offices where we have identified them, however we are prohibited from mailing directly to elected officials. Information reaches these groups largely through the media, legislative research staff and legislative liaisons from our agency.

- The economic development community uses this information for analysis and marketing. Recently the Minnesota Department of Trade and Economic Development produced nine Regional Skills Assessments which highlighted underemployment in Minnesota. Four of the nine reports used job vacancy data, primarily to quantify the demand for labor. This information was compared with results from the Skills Assessment surveys which where structured to determine the supply of labor. Economic development agencies also use job vacancy survey information as a benchmark of the types of jobs available in their communities.

- The workforce development community including Workforce Center staff, Workforce Investment Board (WIB) members and employment and training service providers use job vacancy survey information to plan and set priorities within limited resources and to provide job seekers, as well as specifically Minnesota Family Investment Program (welfare) participants, with current information on the job market. We mail information directly to these groups and follow up with training and presentations where possible. Our regional analysts have direct and ongoing contact with economic developers, workforce center staff and WIB members and are a resource for any questions these groups may have on how to use job vacancy survey information. Finally, for a fee we provide special regional job vacancy survey reports to the WIBs.

- Employers use job vacancy survey information to determine hiring competition and prioritize human resource needs. We mail complementary copies of the report to employers who respond to our survey and request a copy (check box on survey). Employers also hear about the survey through the media. A secondary benefit is that employers who are familiar with job vacancy survey information are more likely to respond to the survey, increasing our response rate.

- Job seekers benefit by having the job vacancy survey information seamlessly incorporated into career information products and services including *Minnesota Careers*, www.ISEEK.org and career information presentations.

Publish Job Vacancy Survey Information
LMI Offices around the country, including our own, publish a number of data sets without providing much analysis of the numbers. These data are eventually incorporated into many products and all sorts of labor market analysis, but the initial data goes out as tables of numbers only. The difference between these data and the job vacancy survey data are that the job vacancy survey data are new to our audiences, only a very short time series is available, and it is particularly important to understand these data in context so as to avoid misinterpretation. For these reasons, we made the decision to publish each set in the form of a report that includes context and analysis as well as tables of numbers.

The *Minnesota Job Vacancy Survey* report includes a summary of major findings that compares findings across time, across occupations and across regions of the state, an overview of how to use job vacancy survey data to measure labor supply and demand and a discussion of each measure presented in the rest of the booklet. The remainder of the report is divided by region, including statewide, Twin Cities and Greater Minnesota findings, with the last section comparing findings across all ten regions of the state. (To read the report on-line go www.mnworkforcecenter.org/lmi/jobvacancy/site/index.htm.)

Job Vacancy Survey data become stale relatively quickly so it is important that these reports be quick to produce and get into the hands of customers. To accomplish this we have developed templates – one for the main report, one for the regional brochures and one for the regional reports. Templates use Excel and Quark. These templates are available to other states through the National Job Vacancy Survey website. Having a design template also helps with the process of creating “brand recognition.” Customers know to look for the publication with the help-wanted ads in the upper right-hand corner.

Overall Minnesota distributed 2,500 copies of the report and 2,000 copies of the regional brochures during the latest round of the survey (this number has increased slightly with each round). So far five out of 11 regions have purchased the regional report for their region.

Incorporate Job Vacancy Survey Information into LMI
Job vacancy survey information informs much of the analysis and writing done in the Minnesota Department of Security (DES) Research and Statistics Office. Vacancy data have tracked the state of the labor market well, and provide detailed information on changing conditions within occupations, something that is not available at the state level through any other data source. Job vacancy survey data also enhance our career information products and services with timely information on open-for-hire jobs. By consistently incorporating job vacancy survey information into our other products and services we enhance those products and services and at the same time further market the job vacancy survey.

Press Release Job Vacancy Survey Findings
The media have given a surprising amount of attention to the job vacancy survey. Numerous articles in local papers around the state highlight job vacancy survey findings each time we publish a new set of data. To encourage this, we press release each report as close to the end of the data collection cycle as possible (about one and a half months after data collection ended in December 2001 for example). We were able to accomplish this by releasing the report as a web publication only, since the turnaround time on a printed publication is quite a bit longer. We attempt to provide interviews that are useful to reporters in that they help them to determine the story these numbers tell.

Customer Feedback and Continuous Improvement
Customer feedback has generally been positive. We have collected customer feedback in two ways; through informal focus groups before and after meetings, and through a customer satisfaction survey in the most recent issue of the *Minnesota Job Vacancy Survey* report. Through informal focus groups we have learned how people are using the job vacancy survey findings and what they like and do not like about the way we present the information. Here is what we have learned:

- The timeliness of the information is very important to customers.

- Customers have asked for longitudinal job vacancy survey data and have asked us to project job vacancy data (which of course we are unable to do).

- Some Workforce Center staff have had difficulty understanding the job vacancy survey material. For example, staff had a difficult time interpreting the job vacancy rate and turnover-adjusted demand information. We plan to review our explanation of these measures and clarify them for the next report.

- Some training and education providers take job vacancy survey information quite literally, planning regional training programs around job vacancy survey findings. In spring 2001 for example, we projected an unrealistically high number of carpet layer positions in Northwestern Minnesota due to a response from one firm and a high multiplier on that one cell. We soon discovered that a job training program in Northwestern Minnesota was taking steps toward developing a program to train carpet layers based on this information alone. We are now considering the best strategy for suppressing data that provide an unrealistic picture of the job market, even if those data are statistically sound.

- Overall, core customers, including workforce and economic developers, WIBs and internal MDES customers really appreciate job vacancy survey information.

Through the customer satisfaction survey we will be able to better understand who our users are, how they use the information and set a benchmark for satisfaction with the product. So far we have only received 8 surveys so the information is scant. Customers who have responded rated their satisfaction with the report as good on average with general appearance receiving the highest rating. Of the eight users, 3 pass it on to someone else and 3 retain the report for more than one month.

Regional Brochures/Reports

Regional job vacancy reports are made available to those service delivery areas (SDAs) requiring geographic detail that cannot be provided by a large job vacancy survey report. Past reports have encompassed geographic areas of two to fourteen counties with urban and rural make-ups. Regional employer numbers vary from about 4,000 to 12,000 though only a fraction of these are actually surveyed.

The regional report consists of three major parts: an introductory section summarizing major findings at the state and regional level, the statewide findings of the survey and finally a specialized section addressing vacancies in the region in question. The reports are based upon the original layout of the statewide report, but include sections on regional findings. The introduction maintains the structure of the statewide report but highlights the findings particular to the region. The statewide results section is unchanged from the statewide report. Finally, the structure of the regional results section is based on the statewide section, but with text and figures specific to that region.

Like the statewide report, the statewide and regional sections are built around seven tables and figures. The information contained in these tables and figures comes from a regional Access database that is derived from the larger statewide job vacancy survey. Additional surveying at the regional level is not required to develop a regional report. Employers are assigned an SDA designation based upon their address. This allows the statewide Access database to be searched (queried) for responses particular to a given SDA. From such a query, a regional job vacancy database can be created.

Specific queries are designed to pull information from the regional database for use in creating the tables that will go in the final report. All tables and figures follow the same format as the statewide report and are saved in an Excel workbook that serves as a template. Information derived from the database queries is cut and pasted into the relevant table in the Excel template. Some summary information such as field totals and averages can be calculated within the Excel spreadsheet. In other cases, specific queries must be developed using the Access database to derive this information. The final tables and figures are pasted into the report document.

The original statewide report written in a Word document serves as a template to produce the regional report. Most of the report's text refers to the tables and figures maintained in the Excel spreadsheets. To facilitate production of multiple reports, linkages can be developed between the Excel workbook and the report document. This cuts down on errors copying numbers from the spreadsheets into text. However, the programming required to create such linkages can be time consuming. If report structure differs between survey rounds (between quarters or years) reprogramming can be time intensive. In addition, variability in vacancy conditions between regions may make such programming unfeasible. Regional job vacancy reports, however, may be produced by manually entering numbers into the text as they appear in the Excel spreadsheets.

The most time-consuming aspect of producing regional reports lies in double checking numbers and editing the final document. Sources of error include: faulty queries in producing the original tables, miscalculation of summary statistics and "typos" produced in transferring numbers from spreadsheet to text. It is necessary that the document not be simply proof-read but queries and calculations be verified by other staff. At least three staff members are typically involved in producing, double-checking and editing the document prior to layout. This goes for the full publication and the website as well.

Cost

The following is a list of staff members needed to conduct a job vacancy survey:

- Lead Analyst

This person should have a background in statistics or economics, a strong working knowledge of Microsoft Excel and Microsoft Access (including the relational aspects of database structure), and strong analytical and written communication skills. He or she should also have experience with or knowledge of the SOC coding structure.

- Technical Support

It is also important that the lead analyst has the appropriate technical support from the following individuals and teams; the analyst responsible for the EDS and the OES team to help with occupational coding. Optional support: if modifications to the survey instrument are planned, it will be necessary to have an Access expert available to make modifications to the data capture system. Also, it helps to have someone skilled at designing a sample. However, the BLS plans to provide support to states who are interested in using the sample selection software.

- Clerical Support

Support staff is needed primarily for data entry. They are also needed to verify contact information via pre-survey telephone calls, conduct telephone reminders, maintain a filing system and answer any questions employers may have about the survey. They should have good telephone and data entry skills and knowledge of SOC coding.

The cost estimates below are based on a sample of 7,600 units and Minnesota's salary levels. Each survey round lasts about five months.

Minnesota chose to produce statistically reliable job vacancy data for 11 regions to support our WIBs. As a result, the sample of 7,600 reflects Minnesota's need for detailed geographical data and funding availability at the time of survey design. Our sample would have been almost cut in half had we done the survey only for the state, the Twin Cities, and the balance of the state, which is how we present findings in our full report. States should keep this option in mind when planning their surveys.

Category	**Detail**	**Salary/Expense**
Analyst, lead	6 months of 1 FTE	$ 30,000.00
Technical support – analysts' time	2 weeks of 1 FTE	2,500.00
Training		1,000.00
Clerical support	4 months of 2 FTEs	20,000.00
Total Staff Costs		**$ 53,500.00**
Printing — survey & reminder cards		2,000.00
Postage — survey & reminder cards		6,000.00
Phone —1-800 (optional)		1,500.00
Cost Per Sampled Unit (7,600 Units)		**$ 8.29**
Design — report and regional brochures	80 to 100 staff hours	2,000.00
Printing — report and regional brochures	1 37-page report and brochures for 9 regions	2,000.00
Mailing — report and regional brochures		600.00
Total Cost — Report and Brochures		**$ 4,600.00**
Total Costs		**$ 67,600.00**

Other Resources

The National JVS Workgroup will continue supporting the JVA system as long as resources are available. Support includes the following:

- Check out the JVS website for updates, workshops, contact information and any new tools that may become available. The address is www.JVSinfo.org

- Contact the JVS Helpdesk at JVS.Mail@state.mn.us. JVS analysts are available to answer your questions or put you in touch with someone who can.

For more information about anything in this guide, or for additional copies, contact the JVS Helpdesk at JVS.Mail@state.mn.us or by phone toll free at 1 (888) 234-1114.

This guide is available on the Internet at www.JVSinfo.org.

Upon request, the information in this brochure is available in alternative formats such as Braille, large print, and on computer disk.