# Report

# 2008 VOTERS LIST QUALITY MEASUREMENT

## ELECTIONS BC

August 2008

BRITISH COLUMBIA
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# EXECUTIVE SUMMARY

This report presents the findings of the 2008 Voters List Quality Measurement for Elections BC. The purpose of the study was to assess the overall quality of the BC Voters List, including an analysis of both its coverage and currency proportion.

## Coverage proportion was 89.3%

List coverage was determined to be 89.3%, based upon a March 31st, 2008 demarcation date. This measure was calculated by comparing the number of registered voters to the estimated population of eligible voters.

## Currency proportion, with imputation of non-responses, was 74.8% (±3.3%)

Using the multiple imputation statistical approach, responses were imputed for each of the non-responses, providing a higher level of certainty about their disposition. The findings from the imputation, taken together with the confirmed responses, provided a currency estimate of 74.8% (±3.3%, 19 times out of 20)[1]. This proportion is higher than each of the currency measures generated throughout the 2004/05 Voters List Quality Audit.

## Overall list quality was 66.7% (±3.3%)

A measure of overall list quality was obtained by multiplying the coverage proportion by the currency proportion. The result of this calculation provided a list quality estimate of 66.7% (±3.3%, 19 times out of 20). This measure indicates that 66.7% of eligible voters are both listed on the Elections BC Voters List and their voter information is correct.

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[1] Refers to a 95% confidence interval.

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## INTRODUCTION

This report presents the findings of the 2008 Voters List Quality Measurement conducted by BC STATS on behalf of Elections BC.  The purpose of the research was to assess the quality of the BC Voters List, both in terms of its currency and its coverage.

By measuring list quality (and its constituent proportions of currency and coverage), it is possible to assess the overall status of the voters list at a given point in time.  This provides insight as to the general comprehensiveness and accuracy of information found within Elections BC's database.  Additionally, currency, coverage and quality estimates provide a basis for  longitudinal analyses; which in turn offer indicators of effectiveness for list improvement activities.

For the currency estimate, two main survey instruments were designed to solicit responses from a sample of 1000 individuals on the voters list: a telephone survey and a mail survey.   Both surveys asked respondents to verify three details in the BC Voters List – specifically, the voter's name, date of birth and home address.   The currency estimate was conducted over a period beginning June 25th and ending August 8th, 2008.

### Report Outline

The remainder of this report includes the following sections:

- RESULTS:  findings from the coverage, currency and quality estimate calculations

- APPENDIX I:  methodology used to create the coverage estimate

- APPENDIX II:  details regarding the sourcing of phone number, survey design, sample selection and stratification, survey administration and the proxy decision rules and imputation of missing data

- APPENDIX III: a copy of the primary telephone script

- APPENDIX IV: a copy of the secondary telephone script (an adjusted version of the primary phone script)

- APPENDIX V: a copy of the mail survey form

- APPENDIX VI: a copy of the introductory letter

- APPENDIX VII: a methodology on phone matching, provided by the vendor responsible for phone sourcing

# RESULTS

## COVERAGE ESTIMATE

The coverage estimate was conducted using March 31st, 2008 as the demarcation date. The population of registered voters in the Elections BC database as of this date was compared to the estimated population of eligible BC voters as determined by BC STATS Population Statistics section. The estimated population of eligible voters was produced as of April 1st, 2008. For a discussion of the methodology used to create the estimate, please see Appendix I.

The population of registered voters was: 2,894,017[2]

The estimated population of eligible voters was: 3,241,686

The calculation of coverage is:

> Registered Voters     =     Coverage (%)
> Estimated Eligible Voters

> 2,894,017     =     **89.3**%
> 3,241,686

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[2] This population differs from that used in the currency estimate as it represents all registered voters, while the population for the currency estimate contains only those registered voters who are allocated to a specific electoral district.

## CURRENCY ESTIMATE

Estimates of currency were based on a population of 2,893,302 registered voters. This population represents only those voters whose record was associated with one of the 79 Provincial Electoral Districts (PED). The remaining 715 registered voters who were allocated to the PED labelled 'ZZZ' in the Elections BC Voters List, were not included in the sampling plan for this study.

### Confirmed Response Findings

There were two sets of findings: confirmed findings and imputed findings. The confirmed findings represent only the data which were collected by BC STATS. However, it should be noted that the confirmed response rate itself is an aggregate measure, consisting both of actual responses and proxy responses. In total, there were 829 confirmed responses out of a sample of 1000, giving a confirmed response rate of 82.9%. The composition of confirmed responses is provided below in Table 1.

**Table 1: Confirmed Response Rates**

| Response | Method of Confirmation | N* | % of Confirmed Responses | Total % |
|---|---|---|---|---|
| YES, my record is current | Mail | 132 | 15.9% | 76.0% |
| | Phone | 359 | 43.3% | |
| | Other ** | 1 | 0.1% | |
| | Proxy | 138 | 16.6% | |
| NO, my record is not current | Mail | 29 | 3.5% | 24.0% |
| | Phone | 60 | 7.2% | |
| | Other** | 3 | 0.4% | |
| | Proxy | 107 | 12.9% | |

* Number of confirmed responses
** Instances where confirmation was not made by phone or mail survey (i.e. voter contacted EBC and confirmed their voter list information directly)

### Imputed Response Findings

The imputed response findings represent the statistical analysis of confirmed responses in combination with unconfirmed non-responses. In order to provide estimates of currency for non-responses, two distinct methods of analysis were used in this study. The first method assumed that all non-responses represent voter records that are not current. This can be thought of as a "worst-case" scenario as it produces a decidedly conservative estimate of currency. Using this approach, the weighted currency proportion was calculated to be 63.7% (±3.0%, 19 times out of 20).

An alternate method of estimation was made possible through the use of multiple imputation. Rather than assuming all non-responses represent an incorrect voter record, multiple imputation treats non-responses as missing at random. It should be noted however, that this does not mean data are missing completely at random (MCAR). Rather, the currency of non-responses can be predicted based on the analysis of relationships between other variables throughout the dataset. The resulting analysis produces a probability as to whether or not the disposition of a non-response is current. Using the multiple imputation approach, the final currency rate was calculated at 74.8% (±3.3%, 19 times out of 20).

As shown in Table 2, the "worst-case" scenario approach produces a noticeably conservative estimate of currency. Comparatively, multiple imputation offers a somewhat more liberal value. When viewed within a historical context, the differing estimates produced by either method, offer measurements of currency that are consistent over time.

Table 2: Percentage of Correct, Incorrect, and Unconfirmed Responses

| Audit | | "Worst Case" Scenario | | | Imputed | | |
|---|---|---|---|---|---|---|---|
| | | Yes | No | Unconfirmed | Yes | No | N |
| VLQA 2004/05 | September, 2004 | 60.0% | 21.2% | 18.8% | 70.8% | 29.2% | 2,000 |
| | November, 2004 | 57.4% | 25.1% | 17.5% | 67.1% | 32.9% | 4,000 |
| | April, 2005 | 64.1% | 22.0% | 13.9% | 72.2% | 27.8% | 1,996 |
| Current Study | August, 2008 | 63.0% | 19.9% | 17.1% | 74.8% | 25.2% | 1,000 |

A further historical analysis reveals that compared to the final imputed currency measurement of 72.2% taken from the 2005 Voters List Quality Audit, the estimate of 74.8% taken from the present study suggests an increase in currency from April 2005 to July 2008. However, determining whether this increase is due to EBC list improvement efforts, or simply a result of sampling error, is constrained by the sample sizes used for each study. The relative proximity between the currency proportions taken from April 2005 and the current study, indicates that BC STATS can only be 83.7% certain that the difference is statistically significant. In other words, there is an 83.7% probability that the increase in currency estimates from 2005 to 2008 are in fact due to EBC's Voters List enhancement activities.

To illustrate this point further, a comparison of the non-imputed currency measures taken from April 2005 and August 2008 can also be performed. Whereas the imputed estimates indicate an increase in currency over time, the non-imputed estimates show a slight decrease in currency from 2005 to 2008. However, as the difference between the April 2005 currency estimate of 64.1% and the August 2008 currency estimate of 63.7% is less than a single percentage point, BC STATS can only be 56.4% certain that the decrease was due to actual changes to the voters list.

The inherent uncertainty of each currency estimate is also reflected in the differing margins of error for the April 2005 and August 2008 studies. By increasing the sample size for a given study, an estimate's margin of error can be reduced non-linearly. This is why the 95% confidence interval for the August 2008 currency estimate encompasses a wider range of values as compared to the April 2005 measurement. The larger sample size used in 2005, as compared to 2008, produces a more precise estimate. It should be noted that the final reported estimate of currency for all iterations of EBC's quality audit is a measure of central tendency. For instance, while the reported currency proportion for August 2008 is 74.8%, the true estimate of currency falls somewhere between 71.5% and 78.1%. See Table 3 for additional detail on this comparison.

**Table 3: Historical Comparison of Currency Proportions**

| Audit | Method of Estimation | Currency | Standard Error | Margin of Error (±) | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| April, 2005 (N=1996) | Non-Imputed | 64.1% | 0.011 | 2.2% | 62.0% | 66.2% |
| | Imputed | 72.2% | 0.010 | 2.0% | 70.2% | 74.2% |
| August, 2008 (N=1000) | Non-Imputed | 63.7% | 0.015 | 3.0% | 60.7% | 66.8% |
| | Imputed | 74.8% | 0.017 | 3.3% | 71.5% | 78.1% |

\* All margins of error are calculated using a 95% confidence interval (i.e. 19 times out of 20)

Due to the relatively small sample size used for this study, BC STATS will defer PED level currency analysis to future quality audits. While the sample design did incorporate PED level stratification, this was done primarily for the purpose of obtaining a sample that was representative of the population of registered voters. The final sample sizes for several strata were so small that their corresponding currency estimates produced margins of error approaching 50%. For this reason, a breakdown of currency estimates by PED will not be included in this report.

## QUALITY ESTIMATE

An estimate of overall list quality was calculated by multiplying the estimated proportion of coverage by the estimated proportion of currency and its associated error term.

Estimated coverage was: 89.3%

Estimated currency was: 74.8% (±3.3%, 19 times out of 20)

The calculation of quality is:

Coverage X Currency = Quality (%)

89.3% X 74.8% (±3.3%) = **66.8 % (±3.3%)**

### Estimated Quality Findings

From the first measurement of the Voters List Quality Audit 2004/05 in September 2004, to the August 2008 estimate, list quality has improved by 17 percentage points. Not surprisingly, the likelihood that this increase represents an actual improvement in voters list quality approaches 100%. A more moderate improvement can be observed between the April 2005 quality estimate and the estimate for August 2008. The probability that a list quality increase of two percentage points from April 2005 to August 2008 is the result of EBC improvement efforts is calculated to be 78.8%.

As the margin of error for this study's quality estimate was determined to be ±3.3% (19 times out of 20), the actual proportion of quality falls within a range of values. As can be seen in Table 4, the actual measure of list quality lies somewhere between 63.5% and 70.0%.

**Table 4: Coverage, Currency and Quality Estimates**

| Audit | Coverage | Currency | Quality | Margin of Error (±) | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| September, 2004 | 70.4% | 70.8% | 49.8% | 2.0% | 47.8% | 51.8% |
| November, 2004 | 88.9% | 67.1% | 59.7% | 1.4% | 58.3% | 61.1% |
| April, 2005 | 89.8% | 72.2% | 64.8% | 2.0% | 62.8% | 66.8% |
| August, 2008 | 89.3% | 74.8% | 66.8% | 3.3% | 63.5% | 70.0% |

Looking forward to future list quality assessments, it is possible to determine what level of improvement is needed in order show a statistically significant effect.  Assuming a probability goal of either 75%, 95% or 99%, a set of quality estimates can be calculated based on several proposed sample sizes.  For example, given a sample size of 5000 voters, an increase in voters list quality of 3.41% would provide a 95% probability that the observed improvement is statistically significant.  In other words, if a future audit using 5000 sample points provided an increase in quality from 66.8% (August 2008 estimate) to 70.2% (an improvement of 3.41%), then  it could be said that there is a 95% probability this difference represents an actual improvement.  See Table 5 for a summary of these values.

**Table 5:  Extent of Quality List Improvements**

| Sample Size | Amount of Improvement | | |
| --- | --- | --- | --- |
| | **75% Probability** | **95% Probability** | **99% Probability** |
| 5000 | 1.42% | 3.41% | 4.82% |
| 3000 | 1.58% | 3.82% | 5.40% |
| 1000 | 2.06% | 4.99% | 7.05% |

## APPENDIX I: ESTIMATING ELIGIBLE VOTER POPULATION

There are four steps to estimating the number of eligible voters in British Columbia.

### Step 1: Estimating Total Population

Statistics Canada produces estimates of the total population for Canada and the Provinces. The reference date for these estimates is the first day of each month and are produced using a component model with the 2001 Census adjusted for net census undercount forming the base. The population counts are released by Statistics Canada quarterly, approximately 3 months after the end of each quarter.

If available, the total population estimated by Statistics Canada is used. However, if the reference date for the eligible voter calculation is outside the published range of Statistics Canada, a forecast of the total provincial population is prepared by BC STATS using a standard component cohort-survival model.  As the dates from the model will not match the voting dates, an interpolation between the closest estimated/forecasted quarterly data is performed to produce a total population count for the voting date.

### Step 2: Removing the Population aged 0 to 17

Age specific estimates of the provincial population are prepared by Statistics Canada each year with a reference date of July 1. The proportion of the British Columbia population aged 18 and over from the latest Statistics Canada estimate is applied to the total population in Step 1 to produce an estimate of the population 18 years of age and over.

### Step 3: Removing Persons in BC Less than 6 Months

An estimate of inter-provincial in-migrants aged 18 years and older for a six month period prior to the reference date is removed from the population estimated in Step 2. The estimate of inter-provincial in-migrants is taken either from Statistics Canada's most recent quarterly estimates, or if the reference period is outside the range published by Statistics Canada, the most recent estimate or forecast of quarterly inter-provincial in-migration prepared by BC STATS.

### Step 4: Removing Non Canadian Citizens

To take into account the resident British Columbia population who are not Canadian citizens the following three components are removed from the population estimated in Step 3.
  a. The 18 and over immigrant population that were counted in the 2001 Census, had arrived in Canada prior to 199 and are not citizens, is subtracted from the population estimated in Step 3.  It is assumed that immigrants in Canada for

more that 10 years who have not become a Canadian citizen will likely never become a citizen of Canada.

b. The immigrant population from the last five years who would be 18 or over as of the reference date are subtracted from the population estimated in Step 3.[3] Given that residency requirements and processing time for citizenship takes a minimum of approximately 4 ½ years, it was considered reasonable to reduce the eligible estimate by the immigrant population for at least that period of time.

c. Non-permanent Residents aged 18 years and over (i.e. persons in BC on a Student Visa, Work or Ministerial Permit, or are Refugee Claimants), are removed from the population estimated in Step 3. As the number of Non-permanent Residents in BC has been relatively stable for the past year, the most recent estimate published by Statistics Canada is used. The population derived in Step 4 is taken as the number of eligible voters as of the reference date.

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[3] The immigrant population for the last five years is based on actual immigrant landings (not census). [Sources: Statistics Canada (quarterly components of population change) and Citizenship and Immigration Canada (personal communication)]

# APPENDIX II: CURRENCY AUDIT – METHODOLOGY

## PHONE SOURCING

Information available in the voter's list, including a voter's name, home address and mailing address, allowed records to be matched with a telephone number.

The matching process consisted of two phases.  First, information for each record was run through an automated matching routine.  If a phone number was successfully matched to a record, the record was removed from further matching attempts.  If however, the automated process was unable to find a telephone number for a particular record, then a manual process was implemented using Canada 411 online.  For additional detail on the rules for automatic and manual matching, refer to Appendix VII.

In total, 818 records were successfully matched to a phone number.  Of these 818 records, the automatic matching routine was able to source 536 phone numbers, whereas manual matches were successful in sourcing a phone number for the remaining 282 records.  Presented in Table 6 is a further breakdown of all 818 numbers, including whether a number was correct or incorrect.

**Table 6: Summary of Sourced Phone Numbers**

| Correctness of Sourced Number | Phone Result | Matching Process | | Total Count | %Total |
|---|---|---|---|---|---|
| | | Automatic | Manual | | |
| Correct | Successfully Completed Survey | 333 | 84 | 468 | 57.2% |
| | Unable to Complete Survey | 30 | 16 | | |
| | Respondent Deceased | 1 | 4 | | |
| Incorrect | Phone Number Not In Service | 37 | 50 | 224 | 27.4% |
| | Wrong Number | 53 | 84 | | |
| Unknown | Correctness of Number Uncertain | 82 | 44 | 126 | 15.4% |

As the phone survey portion of the study progressed, it became apparent that additional phone sourcing of certain records may help bolster the response rate.  As such, the phone survey vendor conducted directory assistance phone matching on 237 records.  These records were chosen based on the results of multiple phone attempts (i.e. the record's number was determined to be incorrect or otherwise unreachable).  Out of this set of 237 records, an additional 119 numbers were successfully matched to a voter.  This resulted in an additional five phone survey completions.

A final set of 54 phone numbers was made available by Elections BC, by way of their administrative files.  Similar to the follow-up sourcing mentioned above, a list of 371 records that had proven to be unreachable by phone or mail, was sent to Elections BC.

From this list, 54 records were found to have a phone number in Elections BC's administrative lists. These 54 numbers were then subsequently reintroduced to the phone survey queue. Unfortunately, the additional 54 did not provide any additional survey completions.

## SURVEY DESIGN

Data were collected through either mail survey, or one of two phone surveys (see Appendix III, IV and V).

The mail survey form allowed respondents to confirm the correctness off three details, as stated in the BC Voters List. Respondents were given the option to state yes or no to the following three details:

- Name
- Date of birth
- Home address

The primary version of the phone survey asked respondents to confirm the correctness of four details, as stated in the BC Voters List:

- Name
- Date of birth
- Mailing address
- Home address

A secondary version of the phone survey incorporated a minor adjustment to the primary phone survey's introduction. This adjustment was required due to the follow-up phone sourcing that occurred during the final portion of the phone survey component.

## SAMPLE DESIGN

For this study, a sample of 1000 voters was drawn from a March 31st, 2008 extract of the Elections BC Voters List. The target population included all eligible BC voters who appeared on the Elections BC Voters List and were allocated to one of the 79 provincial electoral districts. Based on the March 31st extract, the target population consisted of 2,893,302 registered voters.

In order to obtain a sample that accurately reflected the distribution of the target population, a stratified sampling plan was developed. In total 79 strata were used, each assigned to one of BC's 79 PED's. Rather than creating strata level sample sizes that were simply proportional to the population of each electoral district, BC STATS opted

to incorporate variance measures from a previous quality audit. By doing so, it was possible to identify an optimal sample size for each strata that was dependent on the relative heterogeneity of its associated PED. The result was a smaller bound in the error of estimation, as compared to other sampling strategies. The final calculation of sample size for each strata was achieved through the application of a Neymann Allocation (see Figure 1).

**Figure 1: Neymann Allocation**

$$n_i = n \left( \frac{N_i \sqrt{\hat{p}_i \hat{q}_i}}{\sum_{j=1}^{79} N_j \sqrt{\hat{p}_j \hat{q}_j}} \right), \quad i = 1, 2, \dots, 79$$

Usage of the Neymann Allocation is made possible by establishing a set sample size $n$. In greater detail, $n_i$ represents the optimal sample size for the $i$th stratum; $n$ is the overall sample size and $N_i$ is the target population for the $i$th stratum. To provide an existing measure of variance, $\hat{p}_j$, PED level currency proportions were taken from the April 2005 quality measurement. For a distribution of sample sizes, refer to Table 7 and Table 8.

**Table 7: Distribution of Stratified Sample Sizes**

| No. | Provincial Electoral District | PED | Estimated Population* | Measure of Variance** | Optimal Sample Size |
|---|---|---|---|---|---|
| 1 | Abbotsford-Clayburn | ABC | 29,962 | 0.67 | 13 |
| 2 | Abbotsford-Mount Lehman | ABM | 32,552 | 0.74 | 13 |
| 3 | Alberni-Qualicum | ALQ | 36,533 | 0.81 | 13 |
| 4 | Bulkley Valley-Stikine | BLS | 16,210 | 0.62 | 7 |
| 5 | Burnaby Edmonds | BNE | 36,016 | 0.70 | 15 |
| 6 | Burnaby North | BNN | 36,449 | 0.68 | 15 |
| 7 | Burnaby-Willingdon | BNW | 33,122 | 0.65 | 14 |
| 8 | Burquitlam | BUR | 34,113 | 0.70 | 14 |
| 9 | Cariboo North | CBN | 22,591 | 0.69 | 9 |
| 10 | Cariboo South | CBS | 21,004 | 0.62 | 9 |
| 11 | Chilliwack-Kent | CHK | 32,504 | 0.69 | 14 |
| 12 | Chilliwack-Sumas | CHS | 33,355 | 0.81 | 12 |
| 13 | Columbia River-Revelstoke | CLR | 21,474 | 0.85 | 7 |
| 14 | Comox Valley | CMX | 42,393 | 0.77 | 16 |
| 15 | Coquitlam-Maillardville | CQM | 33,642 | 0.70 | 13 |
| 16 | Cowichan-Ladysmith | CWL | 36,399 | 0.83 | 12 |
| 17 | Delta North | DLN | 32,808 | *0.84* | 10 |
| 18 | Delta South | DLS | 33,280 | 0.74 | 12 |
| 19 | East Kootenay | EKT | 26,240 | 0.88 | 8 |
| 20 | Esquimalt-Metchosin | ESM | 35,708 | 0.71 | 15 |
| 21 | Fort Langley-Aldergrove | FLA | 38,494 | 0.80 | 14 |
| 22 | Kamloops | KAM | 36,113 | 0.77 | 14 |
| 23 | Kamloops-North Thompson | KAT | 33,162 | 0.77 | 13 |
| 24 | Kelowna-Lake Country | KLL | 42,776 | 0.84 | 14 |
| 25 | Kelowna-Mission | KLM | 43,200 | 0.61 | 19 |
| 26 | Langley | LLY | 38,291 | 0.80 | 14 |
| 27 | Malahat-Juan de Fuca | MJF | 36,502 | 0.82 | 13 |
| 28 | Maple Ridge-Mission | MRM | 41,097 | 0.77 | 16 |
| 29 | Maple Ridge-Pitt Meadows | MRP | 37,920 | 0.77 | 14 |
| 30 | Nanaimo | NAN | 38,302 | 0.78 | 14 |
| 31 | Nanaimo-Parksville | NAP | 44,113 | 0.76 | 17 |
| 32 | Nelson-Creston | NEL | 29,675 | 0.81 | 10 |
| 33 | New Westminster | NEW | 37,835 | 0.74 | 15 |
| 34 | North Coast | NOC | 16,027 | 0.74 | 6 |
| 35 | North Island | NOI | 35,380 | 0.75 | 14 |
| 36 | North Vancouver-Lonsdale | NVL | 29,891 | 0.63 | 13 |
| 37 | North Vancouver-Seymour | NVS | 30,531 | 0.90 | 10 |
| 38 | Oak Bay-Gordon Head | OBG | 36,925 | 0.70 | 14 |
| 39 | Okanagan-Vernon | OKV | 42,251 | 0.81 | 15 |
| 40 | Okanagan-Westside | OKW | 34,793 | 0.87 | 11 |
| 41 | Peace River North | PCN | 17,843 | 0.86 | 6 |
| 42 | Peace River South | PCS | 15,632 | 0.90 | 4 |
| 43 | Penticton-Okanagan Valley | PEN | 40,915 | 0.92 | 10 |
| 44 | Port Coquitlam-Burke Mountain | PKM | 36,446 | 0.73 | 14 |

**Table 8: Distribution of Stratified Sample Sizes Continued**

| No. | Provincial Electoral District | PED | Estimated Population* | Measure of Variance** | Optimal Sample Size |
|---|---|---|---|---|---|
| 45 | Port Moody-Westwood | PMW | 41,323 | 0.78 | 16 |
| 46 | Powell River-Sunshine Coast | POR | 32,808 | 0.86 | 10 |
| 47 | Prince George-Mount Robson | PRM | 23,560 | 0.59 | 10 |
| 48 | Prince George North | PRN | 23,842 | 0.79 | 9 |
| 49 | Prince George-Omineca | PRO | 24,041 | 0.54 | 11 |
| 50 | Richmond Centre | RCC | 36,264 | 0.72 | 15 |
| 51 | Richmond East | RCE | 36,971 | 0.67 | 16 |
| 52 | Richmond Steveston | RCS | 37,591 | 0.70 | 15 |
| 53 | Saanich North and the Islands | SAN | 41,130 | 0.96 | 7 |
| 54 | Saanich South | SAS | 37,461 | 0.83 | 12 |
| 55 | Shuswap | SHU | 34,238 | 0.78 | 13 |
| 56 | Skeena | SKN | 19,152 | 0.82 | 6 |
| 57 | Surrey-Cloverdale | SRC | 38,824 | 0.79 | 15 |
| 58 | Surrey-Green Timbers | SRG | 30,075 | 0.88 | 9 |
| 59 | Surrey-Newton | SRN | 28,768 | 0.67 | 13 |
| 60 | Surrey-Panorama Ridge | SRP | 33,433 | 0.68 | 15 |
| 61 | Surrey-Tynehead | SRT | 37,820 | 0.75 | 15 |
| 62 | Surrey-Whalley | SWH | 28,004 | 0.79 | 10 |
| 63 | Surrey-White Rock | SWR | 40,603 | 0.91 | 10 |
| 64 | Vancouver-Burrard | VBU | 51,056 | 0.65 | 23 |
| 65 | Vancouver-Fairview | VFA | 43,305 | 0.70 | 16 |
| 66 | Vancouver-Fraserview | VFV | 33,985 | 0.75 | 13 |
| 67 | Vancouver-Hastings | VHA | 36,221 | 0.70 | 14 |
| 68 | Vancouver-Kensington | VKE | 34,355 | 0.65 | 14 |
| 69 | Vancouver-Kingsway | VKI | 34,546 | 0.74 | 13 |
| 70 | Vancouver-Langara | VLA | 34,988 | 0.62 | 15 |
| 71 | Vancouver-Mount Pleasant | VMP | 36,024 | 0.66 | 15 |
| 72 | Vancouver-Point Grey | VPG | 41,864 | 0.67 | 17 |
| 73 | Vancouver-Quilchena | VQL | 38,183 | 0.77 | 13 |
| 74 | Victoria-Beacon Hill | VTB | 41,451 | 0.69 | 17 |
| 75 | Victoria-Hillside | VTH | 36,952 | 0.84 | 12 |
| 76 | West Kootenay-Boundary | WKB | 30,140 | 0.78 | 11 |
| 77 | West Vancouver-Capilano | WVC | 30,292 | 0.76 | 12 |
| 78 | West Vancouver-Garibaldi | WVG | 35,290 | 0.84 | 12 |
| 79 | Yale-Lillooet | YAL | 22,564 | 0.61 | 10 |

\* Estimated population of eligible voters in British Columbia who are allocated to a PED
\*\* Variance measures taken from final audit of the 2004/05 VLQA

## SURVEY ADMINISTRATION

Once phone sourcing was complete, the sample of 1000 records was divided into two groups; voters whose record were successfully matched to a phone number and those who weren't.

If there was a sourceable telephone number for the respondent's record, the voter was sent an introductory letter by standard mail. The letter notified the voter that they would be contacted by telephone in the coming weeks and asked to participate in a short phone survey. From July 2nd to July 15th, 2008, attempts were made to contact 818 individuals by phone. Following the main phase of calling, additional attempts were made between July 15th to August 1st to contact an additional 172 numbers. These numbers were for voters for who a second number was matched to their record, either through follow-up phone sourcing or from Elections BC's administrative files. If a respondent's telephone number was ultimately found to be incorrect or otherwise unreachable, they were then allocated to a sub-list and subsequently sent a letter survey through Canada Post Registered mail.

In sixteen cases, a respondent or family member of a respondent contacted Elections BC directly and confirmed the currency of their voters list information over the phone. The details of this information was then transmitted to BC STATS for inclusion into the study's dataset. Of this sixteen, ten voters also completed a phone or mail survey. For analysis purposes, information collected by Elections BC for the remaining six records was treated as either an actual or proxy survey completion.

If no telephone number was easily attributed to a voter's record, the voter was sent a survey through Canada Post Registered mail. In total, 582 registered letters were mailed to voters, with a mail survey completion rate of 28%. From this set of 582 mailings, 182 letter survey were sent on the initial mailing date of June 27th (the same date all 818 introductory letters were sent). The remaining 400 registered letters were sent out in one of five batches, as part of the sub-list mail outs. See Table 9 for a summary of all registered mailings. Responses, including undeliverable returns, were recorded until August 8th, 2008.

**Table 9: Initial and Sub-list Registered Mailings**

| | Initial Mailing | Sub-list Mailings | | | | | |
|---|---|---|---|---|---|---|---|
| Mail Status as of August 8th | June 27th | July 3rd | July 7th | July 10th | July 14th | July 16th | Total |
| Survey Completed | 72 | 61 | 10 | 8 | 1 | 12 | 164 |
| Registered Letter Returned | 51 | 67 | 13 | 16 | 0 | 3 | 150 |
| Registered Letter Not Returned | 59 | 99 | 21 | 33 | 2 | 54 | 268 |
| Total Registered | **182** | **227** | **44** | **57** | **3** | **69** | **582** |

It should be noted that two observed errors occurred during the mail survey component of the study. The first error resulted in several voters being sent mail surveys with

incorrect voter information. Specifically, where asked to confirm the correctness of their date of birth, a voter's information read 20XX-XX-XX rather than 19XX-XX-XX (i.e. a birth date of January 1st , 1930 would have been printed as 2030-01-01). In every instance where one of these voters completed and returned their mail survey and indicated their date of birth as being wrong, the voter included a written correction on the survey, providing their correct date of birth. As expected, each written correction altered the year of birth from 20XX back to the original 19XX.

The second mail survey error concerned a reminder written at the top of the letter survey form. This reminder requested the voter to mail the completed survey back to BC STATS prior to a specific date. Unfortunately, for some of the sub-list mailings, the suggested return date did not provide an adequate time frame for return. As a result, some voters received a mail survey only a few days before (and in some cases after) the recommended return date. At the present time, it is unknown how this error may have impacted the study's overall response rate.

## DECISION RULES

A set of decision rules were developed in order to guide the data collection and analysis of records where a completed phone or mail survey could not be obtained. Listed below are the main proxy rules used throughout the course of the study. It should be noted that in instances where an inconsistency appeared between actual survey responses and a record's proxy information, the survey data would take precedence. For example, if a telephone response indicated that the voter's home address was correct, but their introductory letter was returned as moved, the record would be considered current.

*Phone proxies:* Due to time constraints, if information could be gathered from other sources (e.g. family member), then that information would be collected and recorded as a confirmed response. This also included instances where a family member contacted Elections BC directly by phone to confirm the currency of a voter's information.

*Canada Post Registered mail proxies:* In order to successfully deliver a piece of registered mail to a home address, Canada Post requires signature confirmation. This signature can be provided by anyone who is fourteen years of age or older at the address. If a mail carrier is unable to deliver the registered mail to the home, then a notice is left on the door indicating to the addressee that there is a piece of mail available for pick up at a nearby post office. In order to successfully pick up the registered mail from a post office, the addressee must provide a piece of photo ID to the Canada Post customer service representative. Acceptable photo ID needs to contain both a name and address that matches the registered mail's delivery information.

In all cases, a digital copy of the signature was uploaded for viewing on the Canada Post tracking website . Based on this information, it was possible to make two separate proxy decisions using signature data.

- If a survey was successfully delivered to an address, the presence of a signature match was considered to be a proxy confirmation that the record was correct. A signature match was defined as any instance where at least the first initial and last name of the digital signature matched the first initial and last name of the record.
- If a survey was successfully picked up from a post office, then due to Canada Post's delivery requirements, the record was also considered a proxy confirmation that the record was correct.

These proxies only applied to cases where no response was received from the addressee prior to the August 8th cut-off date.

*Mail undeliverable proxies:* if the mail was undeliverable as determined by Canada Post, the returns were considered either as an incorrect proxy or unconfirmed, depending on the reason that the letter was not successfully delivered:

The following tracking details were considered as an incorrect proxy: no such address; address incomplete; moved/unknown; no such post office; and item was redirected to receiver's new address.

Records were considered as unconfirmed, if the mail tracking details stated unclaimed; attempted delivery but no pick up; item was picked up but without a recorded signature; item not in Canada Post possession but without a recorded signature; and, item refused by addressee.

## MISSING DATA

In order to estimate voters list currency for unconfirmed responses, BC STATS made use of multiple imputation (MI). Compared to other methods of imputation, the MI method offers several benefits, including the introduction of random variance to the estimate and a robustness to violations of normality.

With this in mind, there are two assumptions that need to be made if missing data are to be estimated through MI. First, the data both before and after imputation, are assumed to follow a multivariate normal distribution. The second assumption is that missing data are missing at random (MAR). As mentioned above, MAR does not mean data are missing completely at random. Rather, the rate at which data are missing can be predicted, based on the analysis of relationships between other variables throughout the dataset.

There are three distinct steps in the process of imputation. First, the imputation process is repeated *m* times to generate *m* complete datasets. Second, *m* datasets are analyzed using conventional statistical tools and third, results from the *m* datasets are combined into a summary set of findings. Typically, as few as three to five imputations are adequate and the end results offer the benefit of introducing uncertainty into the model. This in turn generates valid statistical inferences that correctly reflect this uncertainty due to missing data. For the August 2008 study, five imputed datasets were generated and then combined to produce the final estimates of currency and quality.

In the VLQA 2004/05, six variables were used to predict an unconfirmed record's currency. These variables were age, gender, driver's license, residing in a multi-unit complex, social insurance number, and the currency of confirmed responses. With the exception of age, they were all coded as dichotomous variables with 1 = male or yes, 0 = otherwise. For this study however, some small adjustments were made to this framework of predictive variables.

Based on several observations, the original gender variable was found to have little to no correlation with the currency of confirmed responses in the August 2008 dataset. In its place, a new dichotomous gender variable was created, where the presence of gender information was coded 1 and the absence of gender information was coded 0. As compared to the original gender variable, the new coding of gender data was observed to have a stronger predictive relationship to the overall currency proportion. An additional variable was also created that incorporated the last time a voter's information was updated in the Election BC Voters List. Both the MI procedure and the predictive model were developed and analyzed with SPSS's AMOS 16.

## APPENDIX III: TELEPHONE SURVEY SCRIPT (PRIMARY VERSION)

### INTRODUCTION

Hello may I speak with <Given Name > <Surname >. My name is ___. I am calling on behalf of Elections BC, a non-partisan Office of the Legislature, responsible for administering the Election Act. We are conducting a short 2 minute survey to measure the quality of the provincial voters list.  A record from this address has been selected for confirmation. This quality improvement survey is important to ensure that voters receive necessary voting information.

We would like you to know that responses to this questionnaire will be kept confidential by BC STATS. Under Section 9 of the *Statistics Act*, BC STATS cannot disclose information that could be used to identify an individual response to any person, organization or government agency. Section 9 of the *Statistics Act* applies despite the provisions of the *Freedom of Information and Protection of Privacy Act* (*FOIPPA*), other than *Section 44*(1)(b)(2) (2.1) and (3) of *FOIPPA*.

May I continue?
Continue - correct person............................................................... 01      => Q1
Correct name & number - call back anytime.............................. 20      => /INT3
Correct name & number - specific call back ............................... 21      => /INT3
Not at this number/ address.......................................................... 22      => /INT2
Correct name & number - refused ............................................... 23      => /INT2
Refused - would not confirm if it was the correct person ........... 02      => /END
Call-back - no answer .................................................................. 03      => /END
Line busy ...................................................................................... 04      => /END
Not in service ............................................................................... 05      => /END
Deceased ...................................................................................... 06      => /END
Language difficulties .................................................................... 07      => /END
No phone number .......................................................................... 15      => /END

### INT2

***Proxy end***
Thank you for your time, and have a good day/ afternoon/ evening.
Not at this number/ address......................................................... 22      => /END
Correct name & number - refused .............................................. 23      => /END

### INT3

***Call back end***
Thank you.  We will call back at <Date and Time >.  Have a good day/ afternoon/ evening.
Correct name & number call back anytime................................. 20      => /END
Correct name & number specific call back.................................. 21      => /CB

## Q1

To confirm, is your name <Given Name> <Surname>?

Yes ........................................................................................................... 1
No.............................................................................................................. 2
Refused ..................................................................................................... 3

## Q2

Is your date of birth <Date of Birth >?

Yes ........................................................................................................... 1
No.............................................................................................................. 2
Refused ..................................................................................................... 3

## Q3

*IF ANY ARE WRONG THEN CHOOSE "NO"*
Is your home address:
Unit Number
Building Number
Street Prefix  (East, West, etc.)
Street Name
Street Type
Street Suffix (East, West, etc.)
City?

Yes ........................................................................................................... 1
No.............................................................................................................. 2
Refused ..................................................................................................... 3

## Q4

*IF ANY ARE WRONG THEN CHOOSE "NO"*
Is your current mailing address:
Mail Line 1
Mail Line 2
Mail City
Postal Code?

Yes ........................................................................................................... 1
No.............................................................................................................. 2
Refused ..................................................................................................... 3

## INT4

| => INT if        NOT (Q1=2 OR Q2=2 OR Q3=2 OR Q4=2) |
|---|

***Completed with incorrect information end***
On behalf of Elections BC, I would like to thank you very much for your time today.
If you have any further questions about the survey, or would like to update your registration record, please contact Elections BC toll-free at 1-800-661-8683 or go online to www.elections.bc.ca
Again, thank you for your time, and have a good afternoon/ evening/ day.
Completed – information incorrect ............................................................ 24        => /END

## INT

*End*

On behalf of Elections BC, I would like to thank you very much for your time today.
If you have any further questions about the survey, please contact Elections BC
toll-free at 1-800-661-8683 or go online to www.elections.bc.ca
Again, thank you for your time, and have a good afternoon/ evening/ day.

| | | |
|---|---|---|
| Completed – information is correct (or refused) | 01 | => /END |
| Refused - would not confirm if it was the correct person | 02 | => /END |
| Call-back no answer | 03 | => /END |
| Line busy | 04 | => /END |
| Not in service | 05 | => /END |
| Deceased | 06 | => /END |
| Language difficulties | 07 | => /END |
| No phone number | 15 | => /END |

# APPENDIX IV: TELEPHONE SURVEY SCRIPT (SECONDARY VERSION)

## INTRODUCTION

Hello may I speak with <Given Name > <Surname >. My name is ___. I am calling on behalf of Elections BC, a non-partisan Office of the Legislature, responsible for administering the Election Act. We are conducting a short 2 minute survey to measure the quality of the provincial voters list.  A record from this address has been selected for confirmation. This quality improvement survey is important to ensure that voters receive necessary voting information.

May I continue?

| | | |
|---|---|---|
| Continue - correct person | 01 | => Confirm 1 |
| Correct name & number - call back anytime | 20 | => /INT3 |
| Correct name & number - specific call back | 21 | => /INT3 |
| Not at this number/ address | 22 | => /INT2 |
| Correct name & number - refused | 23 | => /INT2 |
| Refused - would not confirm if it was the correct person | 02 | => /END |
| Call-back - no answer | 03 | => /END |
| Line busy | 04 | => /END |
| Not in service | 05 | => /END |
| Deceased | 06 | => /END |
| Language difficulties | 07 | => /END |
| No phone number | 15 | => /END |

## Confirm 1

You may have recently received a registered letter from Elections BC in which you were asked to fill out a short questionnaire and return by mail.  Did you receive this letter?

| | | |
|---|---|---|
| Yes | 1 | => /Confirm2 |
| No | 2 | => /Confirm3 |
| Refused | 3 | => /Confirm3 |

## Confirm 2

Have you mailed back the completed survey?

| | | |
|---|---|---|
| Yes | 1 | => /INT |
| No | 2 | => /Confirm3 |
| Refused | 3 | => /Confirm3 |

## Confirm 3

Would you like to complete the survey now over the telephone?

| | | |
|---|---|---|
| Yes | 1 | => /Spiel |
| No | 2 | => /INT2 |
| Refused | 3 | => /INT2 |

## INT2

### *Proxy end*

Thank you for your time, and have a good day/ afternoon/ evening.

Not at this number/ address ........................................................ 22          => /END
Correct name & number - refused ............................................... 23          => /END

## INT3

### *Call back end*

Thank you.  We will call back at <Date and Time >.  Have a good day/ afternoon/ evening.

Correct name & number call back anytime ................................. 20          => /END
Correct name & number specific call back.................................. 21          => /CB

## Spiel

We would like you to know that responses to this questionnaire will be kept confidential by BC STATS. Under Section 9 of the *Statistics Act*, BC STATS cannot disclose information that could be used to identify an individual response to any person, organization or government agency. Section 9 of the *Statistics Act* applies despite the provisions of the *Freedom of Information and Protection of Privacy Act* (*FOIPPA*), other than *Section 44*(1)(b)(2) (2.1) and (3) of *FOIPPA*.

Next page to Q1

## Q1

To confirm, is your name <Given Name> <Surname>?

Yes ........................................................................................................ 1
No.......................................................................................................... 2
Refused ................................................................................................ 3

## Q2

Is your date of birth <Date of Birth >?

Yes ........................................................................................................ 1
No.......................................................................................................... 2
Refused ................................................................................................ 3

## Q3
*IF ANY ARE WRONG THEN CHOOSE "NO"*
Is your home address:
Unit Number
Building Number
Street Name
Street Type
Street Prefix/Suffix (East/West/North/South)
City?

Yes ......................................................................................................... 1
No............................................................................................................ 2
Refused ................................................................................................... 3

## Q4
*IF ANY ARE WRONG THEN CHOOSE "NO"*
Is your current mailing address:
Mail Line 1
Mail Line 2
Mail City
Postal Code?

Yes ......................................................................................................... 1
No............................................................................................................ 2
Refused ................................................................................................... 3

## INT4

| => INT if        NOT (Q1=2 OR Q2=2 OR Q3=2 OR Q4=2) |
| --- |

***Completed with incorrect information end***
On behalf of Elections BC, I would like to thank you very much for your time today.
If you have any further questions about the survey, or would like to update your
registration record, please contact Elections BC toll-free at 1-800-661-8683 or go
online to www.elections.bc.ca
Again, thank you for your time, and have a good afternoon/ evening/ day.
Completed – information incorrect ............................................. 24        => /END

## INT

***End***
On behalf of Elections BC, I would like to thank you very much for your time today.
If you have any further questions about the survey, please contact Elections BC
toll-free at 1-800-661-8683 or go online to www.elections.bc.ca
Again, thank you for your time, and have a good afternoon/ evening/ day.
Completed – information is correct (or refused).......................... 01        => /END
Refused - would not confirm if it was the correct person ........... 02        => /END
Call-back no answer .................................................................... 03        => /END
Line busy ...................................................................................... 04        => /END
Not in service .............................................................................. 05        => /END
Deceased ..................................................................................... 06        => /END
Language difficulties .................................................................... 07        => /END
No phone number ......................................................................... 15        => /END

## APPENDIX V: MAIL SURVEY FORM

| | | |
|---|---|---|
| **ELECTIONS BC** Province of British Columbia | Mailing Address: PO Box 9275 Stn Prov Govt Victoria BC  V8W 9J6 | Phone:  (250) 387-5305 Toll Free:  1-800-661-8683 (TTY) 1-888-456-5448 |
| | Location: 333 Quebec Street, Victoria BC | Email:  electionsbc@elections.bc.ca Web Site:  http://www.elections.bc.ca/ |

John/Jane Doe
Street Address
#123 – 456 7th St.

Small Town, BC, V1X 1X1

Month XX, 2008

Dear John/Jane Doe:

Elections BC needs your help.  As the independent, non-partisan Office of the Legislature responsible for administering provincial general elections, by-elections and referendums, we need to ensure our voters list is up-to-date and accurate.

We are conducting a survey of about 1,000 British Columbians to find out if the voters list is up-to-date. That's where we need your help.

We are working with BC Stats, the central statistical agency for British Columbia.  BC Stats is conducting the survey on our behalf to help confirm information on the voters list.  Your record on that list has been randomly selected for confirmation.

We need to know if your information on the enclosed form is correct.  Please complete the questions on the next page and return it in the enclosed pre-paid envelope.  It is important that you return your response to BC Stats no later than July 11, 2008.

We understand the importance of protecting your personal information.  Please know that Elections BC and BC Stats take extreme care to ensure the information you give us is protected and not shared or used for any other purpose than confirmation of your information on the voters list.

If you would like more information about this survey, please visit the Elections BC website at www.elections.bc.ca/reg/enum.htm, or call Elections BC toll free at 1-800-661-8683. Thank you for your help.

Sincerely,

Harry Neufeld
Chief Electoral Officer

Mailing Address:
PO Box 9275 Stn Prov Govt
Victoria BC  V8W 9J6

Phone:  (250) 387-5305
Toll Free:  1-800-661-8683
(TTY) 1-888-456-5448

Location:
333 Quebec Street, Victoria BC

Email:  electionsbc@elections.bc.ca
Web Site:  http://www.elections.bc.ca/

**ELECTIONS BC**
Province of British Columbia

IMPORTANT – PLEASE COMPLETE AND RETURN TO BC STATS NO LATER THAN MONTH XX, 2008

THANK YOU!

| |
|---|
| **Name:** |
| John Doe |
| **Home Address:** |
| #123 – 456 7th St. |
| Small Town |
| **Date of Birth (yyyy-mm-dd):** |
| 1950-01-01 |

1.  Is your **name** on this form correct?     Yes ☐  No ☐

2.  Is the **home address** on this form the correct address for where you live?     Yes ☐  No ☐

3.  Is your **date of birth** on this form correct?     Yes ☐  No ☐

If you have indicated that something is incorrect and would like to update your voter registration information, please contact Elections BC toll-free at 1-800-661-8683 or through the internet online voter registration service at www.elections.bc.ca.

# APPENDIX VI: INTRODUCTORY LETTER

| | | |
|---|---|---|
| | Mailing Address:<br>PO Box 9275 Stn Prov Govt<br>Victoria BC  V8W 9J6 | Phone:  (250) 387-5305<br>Toll Free:  1-800-661-8683<br>(TTY) 1-888-456-5448 |
| ELECTIONS BC<br>Province of British Columbia | Location:<br>333 Quebec Street, Victoria BC | Email:  electionsbc@elections.bc.ca<br>Web Site:  http://www.elections.bc.ca/ |

John/Jane Doe
#123 – 456 7th St.
Small Town, BC, V1X 1X1

> **Home Address**:
> #123 – 456 7th St.
> Small Town, BC, V1X 1X1

**Personal and Confidential**                                          Month XX, 2008

Dear John/Jane Doe:

Elections BC needs your help.  As the independent, non-partisan Office of the Legislature responsible for administering provincial general elections, by-elections and referendums, we need to ensure our voters list is up-to-date and accurate.

We are conducting a survey of about 1,000 British Columbians to find out if the voters lists is up-to-date. That's where we need your help.

We are working with BC Stats, the central statistical agency for British Columbia.  BC Stats is conducting the survey on our behalf to help confirm information on the voters list.  Your record on that list has been randomly selected for confirmation.

Sometime between June 30 and July 11, 2008, you will be contacted either by phone or registered mail. You will be asked to confirm your name, date of birth and home address as it appears on the voters list.

If you are not contacted by July 11, 2008, please call BC Stats, toll free, at 1-888-447-4427.

We understand the importance of protecting your personal information.  Please know that both Elections BC and BC Stats take extreme care to ensure the information you give us is protected and not shared or used for any other purpose than confirmation of your entry on the voters list.

The information you provide is important and will help us to maintain an accurate voters list.  If you would like more information about this survey, please visit the Elections BC website at www.elections.bc.ca/reg/enum.htm, or call Elections BC toll free at 1-800-661-8683. Thank you for your help.

Sincerely,

Harry Neufeld
Chief Electoral Officer

## APPENDIX VII: PHONE SOURCING METHODOLOGY

The following methodology has been provided by the vendor responsible for phone sourcing – ASDE Survey Sampler.

### Automated List Matching

1. Client list is received in any fixed format: Excel, Access, dbf, text, etc.
2. Fields are standardized to match the phone book database format used by ASDE.
3. List is run through the system to look for matches on 25 different combinations of fields and information: from full match of full name and address to match of surname to Postal code, therefore those 2 fields are the most important ones for any list matching success.
4. The system applies weights to various fields of a record and matches them uses those weights to determine if the record is considered acceptable or not.
5. A visual check is conducted to remove multiple numbers resulting from one record. This is included in the standard pricing.
6. The initial list is returned to the client as received with an extra column with the phone number as found in ASDE's database.
7. Match rates vary between 40%-60% depending on various attributes such as the quality and up-to-date status of the list. Due to spelling and other such variables, this can never be a complete process.

### Manual List Matching

Following the process above, ASDE employees look up each record one by one using Canada 411 online. This human one on one judgment factor cannot be obtained in an automated way and means that client can expect up to 80% matches. It also allows for capturing spelling errors in street names or addresses
.
Each record goes through 4-5 passes before it is abandoned:
1. street # - address – city - province
2. address – city - province
3. address - postal code - province
4. surname -partial address- FSA
5. surname – city - province

ASDE normally considers it a match if the record is found to have:

- The same family name, regardless of the address, in the same city (as long as no other listings with the same family name appear in that city).

---

- The same family name, with a matching first name, regardless of the address, in the same city, unless there are multiple listings of that combination of first and last name.
- A different name, but the correct address (ASDE assume here that the 'name' on the client's list lives with the 'different name' of the telephone directory at the correct address.)