

**ASSESSING PUBLIC INCONVENIENCE ON
HIGHWAY AND CONSTRUCTION
PROJECTS - MOTORISTS
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SURVEY METHODOLOGY
SURVEY INSTRUMENT DEVELOPMENT
SAMPLE AND DATA COLLECTION
RESPONDENT PROFILE
KEY GRAPHED RESULTS



OREGON SURVEY RESEARCH LABORATORY
5245 UNIVERSITY OF OREGON
EUGENE, OR 97403-5245
TELEPHONE: 541-346-0824
FACSIMILE: 541-346-5026
EMAIL: OSRL@OREGON.UOREGON.EDU
WWW: [HTTP://DARKWING.UOREGON.EDU/~OSRL](http://DARKWING.UOREGON.EDU/~OSRL)

Brian Wolf, Project Director
Patricia A. Gwartney, Ph.D., Director

INTRODUCTION

In May 2001, the Oregon Department of Transportation (ODOT) contracted with the University of Oregon Survey Research Laboratory (OSRL) to conduct a survey of Oregon adults about experiences and opinions related to travelling through state highway construction and maintenance zones. The study's goal was to obtain statistically valid and reliable information concerning a wide variety of issues related to travel through construction zones, either as a driver or passenger, in each of ODOT's five regions throughout the summer construction and maintenance period. Working closely with ODOT representative, Andrew Griffith, OSRL planned, pretested, and implemented a telephone survey with 2,002 Oregon adults.¹

This report summarizes the survey design, sampling methodology, and data collection. It also provides a demographic and travel-related profile of survey respondents in each region, as well as graphs of key survey results by region. Detailed data analysis of this survey, and complementary surveys of truck drivers' experiences, will be conducted by ODOT.

SURVEY METHODOLOGY

This section describes OSRL's procedures for developing and implementing the telephone survey instrument, the sampling to conduct this representative study, and the actual data collection.

SURVEY INSTRUMENT DEVELOPMENT

The survey's broad goals were to obtain information on the transportation and construction-related opinions, perceptions, and behaviors of Oregon drivers. Of unique concern is how Oregon drivers feel about various issues related to road construction. Survey questions were developed in close consultation with ODOT, with special care exercised to ensure that certain survey questions directly paralleled those on previous ODOT surveys and national surveys, although many were originals.

¹ Including five partial interviews that were nearly completed

The survey interviews averaged 16.7 minutes for respondents to complete, with a range of 7 minutes to 54 minutes.

The survey instrument comprised the following specific subject areas:

1. **Construction zone behavior** - the frequency of travel through construction zones, including avoiding known construction zones.
2. **Delays and inconveniences** - how long a motorist was delayed by a construction project and what they considered to be an acceptable delay with and without advance notice.
3. Feelings about the **ease and safety of travel through construction zones**, including how difficult travel through a zone was and how safe they felt.
4. **Information** - where drivers obtain information about construction zones. Respondents also listed the most used and preferred sources of information about road construction.
5. **Opinions about ODOT** – how well ODOT informs motorists about construction zones, how well ODOT manages construction zones, and respondents' overall opinion about ODOT.
6. **Basic demographic data**, including years of residence in Oregon, age, sex, education, employment, number of adults in the household, number of vehicles in the household, urban-rural community, presence of children in the household, and household income.

The survey instrument was extensively pretested using OSRL's standard three-pronged pretest procedure, involving (a) potential members of the survey population, (b) OSRL's Questionnaire Review Committee, comprised of survey experts from our staff and university-wide advisory committee, and (c) potential users of the data, including ODOT personnel. Individual questions were pretested for clarity, accuracy, validity, and variability of response. The entire instrument was pretested for flow, length, comprehensiveness, and factors that affect respondents' cooperation and attention. Based on these pretests, the survey instrument was revised and finalized.

The survey was then programmed into OSRL's computer-aided telephone interviewing system (CATI), and further pretested. A facsimile of the survey instrument is provided in the "Toplines" section of this documentation. All interviews were completely anonymous. Human subjects approval was obtained from the University of Oregon's Committee for the Protection of Human Subjects.

SAMPLING

OSRL's sampling procedure employs a random-digit-dialing (RDD) algorithm that is used in conjunction with our computer-aided telephone interviewing system (CATI). Sampling is pre-programmed and accomplished without interviewers' intervention. Telephone numbers are generated randomly by the computer and appear automatically on interviewers' computer screens. Telephone calls are placed with a computer keystroke, effectively preventing dialing errors. This sampling system avoids biases encountered from

telephone books and similar lists. In addition, new and unlisted telephone numbers have an equal chance of being selected as established numbers.

For this study, 16,157 telephone numbers were randomly generated. Of those, 70% were disconnected, non-working, non-residential, fax/modem, or other types of telephone lines unsuitable for completing a survey. For 8% of the randomly generated telephone numbers, the telephone was consistently busy or never answered, and thus their suitability for interviewing could not be ascertained. For another 7% of telephone numbers, the adult in the household could not be interviewed because of illness or absence for the study duration, because the sample quota for their region had been filled, or because of a language barrier. (Surveys were only conducted in English.)

The overall survey response rate was 72% and the refusal rate was 7%². This is an outstanding response rate.

Survey sampling errors are calculated to assist data users in assessing how much confidence to place in a particular survey result. Large random samples, as in this study, reduce sampling error. Results for surveys in which there is low variability also have less sampling error. For example, a variable with a 50/50 proportional split has wider confidence intervals than a variable with a 5/95 proportional split. Finally, sampling error is affected by strata in the sample design, in this case, the five regional sub-samples.

For this study, the margin of error for an unweighted variable from the entire sample with a 50-50 proportional split is ± 3 percentage points, at the 95% confidence level. This means readers of the data can be 95% sure that the true population figure is between 47% and 53% (i.e., $50\% \pm 3$ percentage points). The intra-regional margins of error are approximately ± 6.7 percentage points. The margin of error for an unweighted variable from the entire sample with a 5/95 proportional split is ± 1.3 percentage points, at the 95% confidence level and within regions approximately ± 2.9 percentage points.

DATA COLLECTION

Interviewer training was conducted on June 22, 2001. Interviewing was conducted June 25 – October 6, 2001. Interviewers attempted to reach each randomly-generated telephone number up to 22 times, as needed, in order to avoid nonresponse bias. Interviewing was conducted 9:00 AM – 9:00 PM all days of the week until the target sample was achieved. CATI automatically schedules calls which do not result in interviews for different times of the day and different days of the week, or interviewers can schedule interviews for respondents at more convenient dates and times.

Altogether, OSRL interviewers made 60,946 telephone calls to complete 2,002 telephone interviews with adults in randomly-chosen households. This sample was stratified by ODOT Region, with the aim of achieving approximately 400 completed interviews in each region. Regions were determined in the first survey question, when respondents reported

² The response rate was calculated in following manner: Completed interviews / (Eligible sample + ((Eligible sample / (Eligible sample + Ineligible sample)) * Sample with unknown status)).

the county they live in. The achieved regional sample sizes are: Region 1 n = 401, Region 2 n = 400, Region 3 n = 401, Region 4 n = 400, Region 5 n = 400.

- Region 1 Encompasses Portland and the surrounding area. This population is mainly urban. Although this region is the smallest in geographical area, it is the largest in terms of population. Region 1 includes Clackamas, Columbia, Hood River, Multnomah and Washington counties.
- Region 2 – Includes the Salem and Eugene metropolitan areas, and the majority of the Willamette valley, stretching between the western slope of the Cascades to the northern half of the coast region. Region 2 includes Benton, Clatsop, Lane, Lincoln, Linn, Marion, Polk, Tillamook, and Yamhill counties.
- Region 3 - Covers the southwestern portion of the state between the south coast and the cascades. Region 3 includes Coos, Curry, Douglas, Jackson, and Josephine counties.
- Region 4 – Encompasses the central section of the state east of the Cascades. Region 4 includes Crook, Deschutes, Gilliam, Jefferson, Klamath, Lake, Sherman, Wasco, and Wheeler counties.
- Region 5 – Includes the eastern part of the state, while the land area is vast, the population density is very low. Region 5 includes Baker, Grant, Harney, Malheur, Morrow, Umatilla, Union, and Wallowa counties.

SURVEY RESULTS

This analysis provides a demographic and travel-related profile of survey respondents by region, as well as graphs of several key regional comparisons.

PROFILE OF SURVEY RESPONDENTS – REGION 1

- **Urban/rural:** In Region 1, 77% of respondents self-reported residing in urban or suburb areas.
- **Age:** The age distribution of the Region 1 sample is 18% ages 18 to 29, 18% ages 30 to 39, 27% ages 40 to 49, 21% ages 50 to 59, 7% ages 60 to 69, and 8% ages 70 and greater.
- **Race/ethnicity:** Fully 86% of those interviewed in Region 1 were white, 4% Asian or Pacific Islander, 2% each African American, Latino/Hispanic, American Indian, and refused, and 1% each mixed race and “other”.
- **Sex:** The Region 1 sample’s sex composition is 56% female and 44% male. This larger percentage female is very similar to other population surveys and reflects the population’s aging (women outlive men).
- **Education:** The educational distribution of Region 1 interviewees is 4% less than high school, 25% a high school diploma or GED, 29% some college (including Associate’s degrees), and 41% a bachelor’s degree or more.

- **Income:** The median household income range in the region is \$40,000 to \$70,000, the modal income category in the region is \$70,000-\$100,000. Twelve percent said income was over \$100,000 while 4.5% said that they made less than \$15,000. Over 9% refused the question.
- **Employed:** Seventy-three percent of Region 1 respondents are employed, 13% retired, 5% keeping house, and 3% unemployed.
- **Children:** In Region 1, 32% of the sample has children age 12 or under living at home.
- **World Wide Web:** Nearly four-fifths (79%) of the Region 1 sample reported having access to the World Wide Web at home, work, or school.
- **Drive for Job:** Of those surveyed, 31% said that they drove as part of their job duties.
- **Licensed drivers:** The number of licensed drivers per household in Region 1 is 1% zero drivers, 25% one driver, 57% two drivers, 9% three drivers, and 7% four or more drivers in household.
- **Driving experience:** Thirty-eight percent of respondents in Region 1 reported driving 31 years or longer, 27% 21 to 30 years, 18% 11 to 20 years and 15% had 10 years or less driving experience.
- **Driving frequency:** Over two-thirds (70%) Region 1 drivers reported driving seven days a week.
- **Miles driven:** Miles driven per day varied greatly in Region 1, with a median of 20 miles and a modal response of 11 to 20 miles. Fifty-eight percent drive 6 to 30 miles per day.

PROFILE OF SURVEY RESPONDENTS – REGION 2

- **Urban/rural:** In Region 2, 59% reside in self-reported urban or suburban areas.
- **Age:** The age distribution of the Region 2 sample is 14% ages 18 to 29, 17% ages 30 to 39, 24% ages 40 to 49, 18% ages 50 to 59, 14% ages 60 to 69, and 12% ages 70 and greater.
- **Race/ethnicity:** Fully 88% of those interviewed in Region 2 were white, 3% Latino/Hispanic, 3% Asian or Pacific Islander, 1% each American Indian, mixed race, “other” and refused, and 1% African American.
- **Sex:** The Region 2 sample’s sex composition is 56% female and 44% male.
- **Education:** The educational distribution of Region 2 interviewees is 6% not completing high school, 26% a high school diploma or GED, 35% some college (including Associate’s degrees), and 30% a bachelor’s degree or more.
- **Income:** The median household income range in the region is \$40,000 to \$70,000, that was also the modal income category. Eight percent said income was over \$100,000 while 5.3% said that they made less than \$15,000. Almost 12% refused the question.
- **Employed:** Sixty-one percent of Region 2 respondents are employed, 20% percent said they were retired, 7% keeping house, 4% percent were students and 3% were unemployed.
- **Drive for Job:** Of those surveyed, 32% said that they drove as part of their job duties.
- **World Wide Web:** Seventy-six percent of the Region 2 sample reported having access to the World Wide Web at home, work, or school.

- **Licensed drivers:** The number of licensed drivers per household in Region 2 is 20% one-driver, 62% two drivers, 14% three drivers, and 4% four or more drivers in household.
- **Driving experience:** Forty-four percent of Region 2 respondents reported driving 31 years or longer, 24% 21 to 30 years, 17% 11 to 20 years and 11% had less than 10 years of driving experience.
- **Driving frequency:** Almost two-thirds, or 64% of the Region 2 sample reported driving seven days a week.
- **Miles driven:** Miles driven per day varied greatly in Region 2, with a median of 20 miles and a modal response of 11 to 20 miles. Fifty percent drive 6 to 30 miles per day.
- **Children:** Thirty percent of the Region 2 sample has children age 12 or under living at home.

PROFILE OF SURVEY RESPONDENTS – REGION 3

- **Urban/rural:** More than half of the Region 3 respondents (55%) said that they lived in rural areas, 25% in suburban, and 18% in urban areas.
- **Age:** The age distribution of the Region 3 sample is 11% ages 18 to 29, 12% ages 30 to 39, 18% ages 40 to 49, 22% ages 50 to 59, 17% ages 60 to 69, and 19% ages 70 and greater.
- **Race/ethnicity:** Over 92% of those interviewed in Region 3 were white, 2% Latino/Hispanic, 1% each American Indian, mixed race, “other” and refused. No one in Region 3 said they were a Asian or African American.
- **Sex:** The Region 3 sample’s sex composition is 54% female and 46% male.
- **Education:** The educational distribution of Region 3 interviewees is 8% not completing high school, 32% a high school diploma or GED, 36% some college (including Associate’s degrees), and 23% a bachelor’s degree or more.
- **Income:** The median household income range in the region is \$25,000 to \$40,000, the modal income category was \$40,000 to \$70,000. Five percent said income was over \$100,000 while 7% said that they made less than \$15,000. Over 14% refused the question.
- **Employed:** Sixty-one percent of Region 3 respondents are employed, 20% percent said they were retired, 7% keeping house, 4% percent were students and 3% were unemployed.
- **World Wide Web:** Sixty-three percent of the Region 3 sample reported having access to the World Wide Web at home, work, or school.
- **Drive for Job:** Of those surveyed, 29% said that they drove as part of their job duties.
- **Licensed drivers:** The number of licensed drivers per household in Region 3 is 25% one-driver, 61% two drivers, 8% three drivers, and 6% four or more drivers in household.
- **Driving experience:** Over 60 percent of Region 3 respondents reported driving 31 years or longer, 17% 21 to 30 years, 12% 11 to 20 years and 8% had less than 10 years of driving experience.
- **Driving frequency:** Over two-thirds, or 68% of the Region 3 sample reported driving seven days a week.

- **Miles driven:** Miles driven per day in Region 3 varied greatly, with a median of 20 miles and a modal response of 11 to 20 miles. Fifty percent drive 6 to 30 miles per day.
- **Children:** In Region 3, 22% the sample has children age 12 or under living at home.

PROFILE OF SURVEY RESPONDENTS – REGION 4

- **Urban/rural:** Sixty percent Region 4 said that they lived in rural areas, 22% in suburban and 15% in urban areas.
- **Age:** The age distribution of the Region 4 sample is 15% ages 18 to 29, 19% ages 30 to 39, 22% ages 40 to 49, 17% ages 50 to 59, 16% ages 60 to 69, and 11% ages 70 and greater.
- **Race/ethnicity:** Over 95% of those interviewed in Region 4 were white, 1% Latino/Hispanic, 1% each American Indian. No one in the sample said they were Asian, Native American or African American.
- **Sex:** The Region 4 sample's sex composition is 56% female and 44% male.
- **Education:** The educational distribution of interviewees in Region 4 is 7% not completing high school, 31% a high school diploma or GED, 36% some college (including Associate's degrees), and 24% a bachelor's degree or more
- **Income:** The median household income range in the region is \$40,000 to \$70,000, that was also the modal income category. Eight percent said income was over \$100,000 while 5% said that they made less than \$15,000. Over 9% refused the question.
- **Employed:** Sixty-three percent of Region 4 respondents are employed, 25% percent said they were retired, 8% keeping house, 2% were unemployed less than 1% were students.
- **World Wide Web:** Seventy percent of the Region 4 sample reported having access to the World Wide Web at home, work, or school.
- **Drive for Job:** Of those surveyed, 33% said that they drove as part of their job duties.
- **Licensed drivers:** The number of licensed drivers per household in Region 4 is 18% one-driver, 65% two drivers, 12% three drivers, and 4% four or more drivers in household.
- **Driving experience:** Forty-eight percent of Region 4 respondents reported driving 31 years or longer, 17% 21 to 30 years, 19% 11 to 20 years and 10% had less than 10 years of driving experience.
- **Driving frequency:** Exactly two-thirds, or 68% of the Region 4 sample reported driving seven days a week.
- **Miles driven:** Miles driven per day varied greatly in Region 4, with a median of 20 miles and a modal response of 11 to 20 miles. Fifty-five percent drive 6 to 30 miles per day.
- **Children:** Thirty-one percent of the Region 4 sample has children under are 12 living at home.

PROFILE OF SURVEY RESPONDENTS – REGION 5

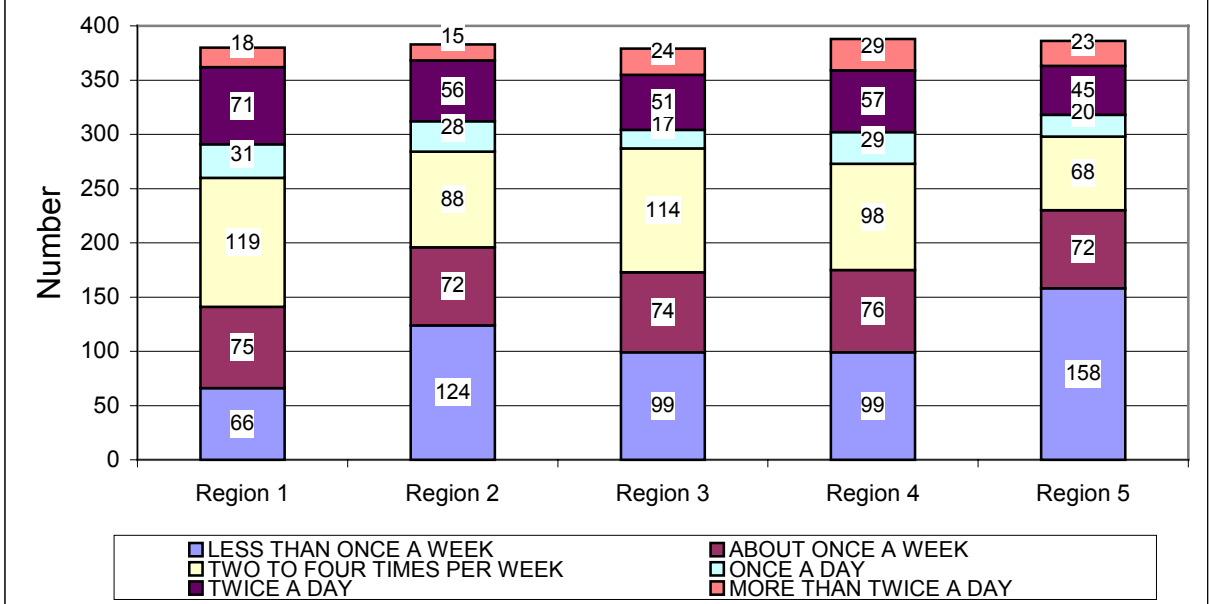
- **Urban/rural:** Sixty percent said that they lived in rural areas, 22% in suburban and 15% in urban areas.

- **Age:** The age distribution of the Region 5 sample is 17% ages 18 to 29, 12% ages 30 to 39, 22% ages 40 to 49, 22% ages 50 to 59, 13% ages 60 to 69, and 12% ages 70 and greater.
- **Race/ethnicity:** Ninety percent of those interviewed in Region 5 were white, 5% Latino/Hispanic, 2% American Indian. Less than 1% in the region said they were Asian, Native American, African American mixed or other races.
- **Sex:** The Region 5 sample's sex composition was nearly evenly split at 51% female and 49% male.
- **Education:** The educational distribution of Region 5 interviewees is 12% not completing high school, 31% a high school diploma or GED, 35% some college (including Associate's degrees), and 22% a bachelor's degree or more.
- **Income:** The median household income range in the region is \$25,000 to \$40,000, the modal income category was \$40,000 to \$70,000. Four percent said income was over \$100,000 while 8% said that they made less than \$15,000. Over 9% refused the question.
- **Employed:** Sixty-seven percent of Region 5 respondents are employed, 21% percent said they were retired, 3% keeping house, 2% were unemployed, and 2% were students.
- **World Wide Web:** Seventy-three percent of the sample reported having access to the World Wide Web at home, work, or school.
- **Drive for Job:** Of those surveyed, 26% said that they drove as part of their job duties.
- **Licensed drivers:** The number of licensed drivers per household in Region 5 is 21% one-driver, 58% two drivers, 13% three drivers, and 5% four or more drivers in household.
- **Driving experience:** Forty-eight percent of Region 5 respondents reported driving 31 years or longer, 21% 21 to 30 years, 14% 11 to 20 years and 13% had less than 10 years of driving experience.
- **Driving frequency:** Almost three-three quarters, or 73% of the Region 5 sample reported driving seven days a week.
- **Miles driven:** Miles driven per day varied greatly in Region 5, with a median of 20 miles and a modal response of 11 to 20 miles. Forty-five percent drive 6 to 30 miles per day.
- **Children:** In Region 5, 32% of the sample has children age 12 or under living at home.

GRAPHED COMPARISONS OF KEY RESULTS BY REGION³

³ Since the sample sizes examined for each graph are roughly even, n's are generally presented instead of percentages.

Frequency of Trips Through Construction Zones, by Region



Yes, it is possible to avoid zone using alternate route (ALTROUT)

