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INSTITUTE OF TRANSPORTATION STUDIES
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Supply Side Evaluation of Radio Traffic Information

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ABSTRACT

The study investigated data collection and dissemination processes of radio traffic information in the San Francisco Bay Area. Program directors from thirty two radio stations were interviewed to understand the processes and radio traffic reports were analyzed to evaluate the contents. The study showed that morning traffic conditions were broadcast most frequently. During morning peak hours from **6AM-9AM**, the majority of the stations broadcast traffic conditions every 15 minutes. The content of the radio information is limited to traffic flow, incident conditions and transit schedule. The traffic conditions were reported in qualitative terms, information about travel time delays or lane blockage duration's were not included in typical radio reports.

EXECUTIVE SUMMARY

The paper presents the results of an empirical study dealing with radio traffic reporting in the San Francisco Bay Area. One half of the radio stations that provide traffic reporting in the Bay Area were surveyed to evaluate the method of data dissemination, rate of reporting, and content of radio information.

The purpose of this investigation was to establish baseline data that can be used to measure the effectiveness of an advanced traveler information system. In particular, the findings of this study will be used for comparison with the data after the implementation of the TravInfo project, the field operational test (FOT) of the Bay Area advanced traveler information systems. The survey of radio stations indicated that morning traffic reports are broadcast most often with an average frequency of approximately 12 reports during peak hours. The radio stations in the North Bay Area provide a lower frequency of traffic reports relative to the entire Bay Area due to the lower population density and less severe traffic congestion. Frequency of traffic reports is not closely associated with listeners' traffic information needs. The radio information contents are mostly qualitative in nature; information regarding queue lengths, travel time delays, lane blockage duration's, alternative route advice is seldom provided in radio traffic reports. Because radio traffic reports have a rapid and summary delivery style radio information is difficult to comprehend. The vast majority of stations cover the entire Bay Area; therefore an extensive geographic coverage of traffic conditions is required and consequently short, wide-area broadcasts sacrifice those details necessary for travelers to make most informed travel decisions.

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1. INTRODUCTION

The conventional wisdom is that Advanced Traveler Information Systems (ATIS) will improve traffic safety, reduce travel time and enhance travel conditions. Several studies have indicated that ATIS will provide substantial benefits to travelers as well as to traffic operators in the areas of traffic management and freeway utilization [1][2][3]. The net marginal benefits of ATIS, however, are not well understood because of the lack of data regarding both the current practice of traffic information dissemination and the current use of traffic information. To measure the marginal benefits of ATIS, it is necessary to understand the supply and demand relationship between the manner in which suppliers provide traffic information and the way in which travelers receive information. This paper is aimed at an understanding of the current traffic information supply, specifically, commercial radio traffic reporting in the San Francisco Bay Area. Presently, the primary means of acquiring traffic information for the Bay Area is through commercial radio and television, even though traffic information is also available to the public through cellular and conventional telephones.

The objective of the study was to investigate major attributes of Bay Area radio traffic reporting including frequency distribution and information content. The questions addressed in this study were: 1) how is the traffic information being disseminated, 2) what is the rate of traffic reporting through commercial radio channels, and 3) what is the information content being disseminated? To address the above research questions, telephone interviews were conducted with the program directors of Bay Area commercial radio stations. This paper summarizes the results of the telephone interviews with program directors of Bay Area commercial radio stations.

The purpose of the present investigation is to establish baseline data on radio traffic reporting in the Bay Area so that they can be used later for comparison with other ATIS data sets such as the TravInfo FOT project [4]. Bay Area traffic data are currently collected by the California Highway Patrol (CHP) and Caltrans and privately operated sources, including Shadow Broadcast Services and Metro Networks. Traffic data are disseminated mostly through commercial radio and television. When the TravInfo project is implemented, it will provide a centralized traveler information center (TIC) from which real-time traveler information can be broadly disseminated

to the public through various media including the telephone and a designated FM radio channel as well as through cable television channels dedicated to traveler information reporting. With the new ATIS system, value-added resellers (VARs) can be linked to the TravInfo database and can disseminate relevant information, tailored to their individual customers' needs, through cellular phones, pagers, and in-vehicle devices.

The paper begins with an overview of Bay Area radio traffic reporting followed by the methods used for collecting and analyzing radio traffic reports. The results of the telephone interviews with radio station representatives are then presented.

2. OVERVIEW

In the Bay Area, two private companies, Shadow Broadcast Services and Metro Networks, provide radio traffic reporting services for nearly all the Bay Area radio stations which broadcast traffic information. Although these companies produce and deliver radio traffic reports, the radio stations determine such parameters as the frequency, length, road/transit network coverage area and style of the reports which they broadcast. In addition to using their own aircraft, these companies collect traffic data from other sources including California Highway Patrol computer aided dispatch (CAD), airplane and helicopter patrols, CB scanners, police and fire reports, cellular telephone callers, Caltrans fax reports and closed circuit television. Both companies are equipped with the necessary broadcasting equipment to produce live radio and television broadcasts at their own facilities. Some radio stations elect not to identify the name of the company providing the traffic report; instead, a unique name is used for their station's traffic reports. These companies often tailor the format and style of their traffic reports to fit the needs of the individual radio stations. They also typically sell advertising time associated with their traffic reports; advertisements can either be read directly by the traffic reporter or pre-taped commercials can be broadcast prior to or following the traffic reports. The time per traffic report allocated for advertising varies, typically in proportion to the length of the traffic report itself.

3. METHODOLOGY

For this study, two methods were used for collecting data on Bay Area radio traffic reporting; a survey of Bay Area radio stations and the recording of radio traffic reports. During the months of February and March of 1995, telephone interviews were conducted with program directors from **32 AM** and FM radio stations which broadcast Shadow and Metro reports. Of the 62 stations contacted, **32** responded to the survey. The sample size was approximately 50 % of the commercial radio stations (**62** stations) that provide traffic reporting services in the Bay Area.. Representatives of Metro Networks and Shadow Traffic were also interviewed.

The interview format was semi-structured, including a fixed set of open-ended questions along with more spontaneous probe questions (Appendix A). Questions were categorized into three sections: 1) collection and dissemination method of traffic information, 2) sequence and duration of reporting, and 3) marketing strategies.

In May 1995, 16 traffic reports broadcast by three radio stations were taped randomly during morning peak hours. The taped reports were transcribed to evaluate the content of the traffic information. Additional data were gathered from written reports and literature provided by the radio stations participating in the telephone survey. In the following section, the results of the telephone interviews are summarized.

4. RADIO STATION SURVEY RESULTS

The interviews were directed to obtain information in three categories: 1) collection and dissemination method of traffic information, 2) sequence and duration of reporting, and 3) marketing strategies.

4.1 Collection and Dissemination Method of Traffic Information

a) Source of traffic information that radio stations are using:

Shadow Broadcast Services (or Shadow Traffic) is the source of traffic information for **22** stations in the Bay Area, ten of which were surveyed. Metro Networks (or Metro Traffic) is the source of traffic information for 40 stations, **22** of which were interviewed. Only one station surveyed, KGO, gathers its own traffic information by observation from its aircraft. However, KGO does receive traffic information from Metro Traffic during off-peak periods. Many stations also use information derived from listener calls through GTE Mobilnet and Cellular One (typically these calls are received directly by either Metro or Shadow, not by the radio stations). All stations make emergency announcements following earthquakes, major accidents, fires, and other catastrophes.

b) Reporting method:

Most stations have one of the two private companies broadcast the traffic reports directly. Of the **32** radio stations surveyed, 10 stations, including each of the Spanish-language stations surveyed, do their own reporting using a teletype report provided by either Metro or Shadow. In the case of an emergency, Metro or Shadow often report directly or the radio station might itself make a brief announcement.

c) Information edit:

Other than cutting off a report because of time constraints, the radio stations served by these two companies do not edit the reports delivered to them. Stations which deliver their own reports based on information supplied to them by Metro or Shadow might edit the information but rarely do so and then only to ensure that the report fits within the allotted time. Each of the Spanish-

language stations surveyed translates these companies' teletyped reports as they read them on the air so they have virtually no time to edit the reports.

d) Time of day and frequency of reporting:

Morning traffic reports are broadcast most frequently by the stations surveyed, with an average frequency of approximately 12 reports between 6:00 and 9:00 a.m (Figure 1). During this time period the majority of the stations broadcast every 15 minutes, KCBS broadcasts traffic reports every ten minutes as they do 24 hours a day throughout the week, one station broadcasts approximately every seven to eight minutes and one station broadcasts only once per hour. During the noon hour, seven stations broadcast one or two reports, while KGO and KCBS continue to broadcast every ten minutes. During the afternoon, traffic reports are broadcast fairly frequently as the commute period commences; however, afternoon traffic reports are not broadcast as frequently as in the morning. The average frequency of radio traffic reports broadcast between 3:00 and 6:00 p.m. is approximately six per station. Several stations have no afternoon traffic reports, although paradoxically, these are not the stations with the least frequent morning traffic reports. After 7:00 p.m., only seven stations continue to broadcast traffic reports; three broadcast only one report, two broadcast eight reports and **KGO** and **KCBS** continue to broadcast traffic reports every ten minutes.

Of the stations surveyed, the average frequency of traffic reports broadcast during an entire day is approximately **27**, with a high of 144 and a low of eight (Figure 2). Reasons for the difference in the frequency of reports broadcast among stations are not readily identifiable. For example, one might hypothesize that the frequency of traffic reports is related to a station's program format, i.e., a talk/news station might have a higher frequency of reports than a rock music station (Figure 3). However, based on the survey results this is not necessarily the case as Bay Area radio stations with similar program formats do not necessarily have similar traffic report frequencies. In some cases in the Bay Area, the radio station location is linked to the frequency of traffic reports. For the most part, those radio stations located in the northern periphery of the Bay Area have a lower frequency of traffic reports relative to the entire Bay Area, principally due to the lower population density and less severe traffic congestion in this portion of the Bay Area (Figure 4).

The frequencies of traffic reports broadcast by stations located in San Francisco, San Mateo, San Jose and Oakland range from low to high.

e) Method of arriving at the frequency of reporting:

While radio stations suggest traffic information is important, a clear majority have not conducted surveys to gauge actual listener response to traffic information. When asked how the radio station had decided on the frequency of the traffic reports that they broadcast, most stations indicated that they had not conducted any surveys to help them determine an appropriate frequency. Several stations specifically said that they arranged traffic information reports according to their existing format, that is, they squeezed reports in where space was available. About a third of the stations said they had conducted surveys regarding listener needs for traffic information; these stations are all served by Metro Traffic. Metro Networks prepares an annual report on the market demand for radio traffic information. It is possible that some stations partially or completely base the frequency of their broadcasts on this report. Two stations did not do surveys simply because of their North Bay location, an area where they could surmise that traffic information was of less value to their listeners. However, there does not seem to be a strong tie between researched awareness of listeners' traffic information needs and frequency of traffic reports, as many stations at both extremes of reporting frequency have and have not conducted surveys; there appears to be no pattern amongst those who conduct surveys.

4.2 Sequence and Duration of Reporting

a) Sequence of traffic reporting with the program:

Most traffic reports are surrounded by music or other programming before and advertisements afterwards. Others are within news segments or advertisement clusters.

b) Duration of reporting time:

The length of most traffic reports is between **30** and **45** seconds, with one-third to one-half of that time allocated for advertisements. If Metro or Shadow go beyond the time allotted by the radio station, the station may cut into their broadcast.

4.3 Marketing Strategies

a) Style and content of information:

All stations agreed that content has precedence over style, although nearly all stations emphasized the importance of an articulate report, since reports are typically very brief with a lot of information.

b) Keeping and losing listeners:

Twelve stations stated that they do not know whether they keep or lose listeners during traffic reports. Fifteen stations believe that they keep listeners and many of those believe that they do so by keeping the traffic reports concise. Four stations believe that they keep listeners because of their geographically concentrated traffic reports. One station admitted that they might lose some listeners during traffic reports.

c) Marketing strategies for keeping listeners:

Few stations indicated that they need do anything to make a traffic report seem attractive to listeners, although many stations promote the set of songs which follows the report.

5. CONTENTS OF RADIO TRAFFIC REPORTS

To examine the content of Bay Area commercial radio traffic reports, 16 reports from three stations (KFRC, KCBS, KNEW) were randomly selected and recorded. The selected excerpts were transcribed as accurately as possible to analyze the content and the style of the report. The analysis of the report contents is presented in this section.

5.1 Examples of Radio Traffic Report Excerpts

The examples shown in this section are traffic reports broadcast by three different radio stations. The words used in the traffic reports were analyzed in order to classify the character of the information content.

Radio Station 1

"Bay Bridge commuting, well there are a couple of stalls now thrown on the span, the metering lights have been turned on, it's an end block back-up, the stall westbound west of the tunnel was a slow mover that conked out now and apparently it's in the right lane, the other one that was just after that they've moved off apparently so it's not much of a worry at this time. Public transportation looks pretty decent as you make your way into San Francisco on BART or Caltrain."

Radio Station 2

"Let's look at Benicia Bridge commute, a bit slow as you head for Contra Costa County out of Solano...Well, traffic is fine on the Benicia Bridge southbound itself, you will find it heavy southbound 680 on the approach...Northbound 280 at 85, there's an accident there, CHP en route to investigate that. Now, for the main problem, still is slow traffic leaving San Francisco International because of an earlier problem...Well, the accident was south 101 at 92, that has just been completely cleared from the roadway, all lanes are reopened, it's gone from the shoulder, but southbound traffic remains very heavy from the San Francisco International Airport down to Broadway, Burlingame, then again from Poplar Avenue down to East Hillsdale. If you're headed northbound on 101, expect slow going from 92 to Peninsula. People have to stop to make the transitions at 92, so it's gonna take that a while to unwind. You might think about using 280, taking 380 from the airport and using 280 as an alternative to go south. Meanwhile, it's backed up into the Bay Bridge maze and eastbound 24 is still slow to the Caldecott because of an earlier stall."

Radio Station 3

"In San Jose, 280 and 101 are problem-free right now. 101 did have an earlier problem though at 13th Street, an earlier accident, it's tightened up now, north of Alum Rock trying to get to Trimble Road. East 24 at the Caldecott, a spin-out accident being cleared out of the way. We do have a crash in the mountains, Highway 35, that's Skyline at Bear Creek Road. We have an accident there blocking the roadway. No problems to report at the bay bridges, but we're backed up into the 580 maze now on the way to the Bay Bridge and the Golden Gate is still delay, or accident, free, it's starting to bog down on the bridge deck."

5.2 Content of Traffic Information

The content of radio traffic information consists of five major categories: 1) status of flow, 2) bridge metering, 3) incident/accident location, 4) rail transit operation, 5) advice on alternate routes, 6) local traffic conditions. The information is mostly directed toward traffic flow on freeways, especially at recurring bottle necks and unexpected incidents/accidents. Information is also directed to cover rail transit services, mostly BART and Caltrains. The content of the information can be irrelevant to many individual travelers because it is general in nature and it covers the entire Bay Area region. One of the major dilemmas facing radio traffic reporters appears to be the vast coverage areas of many stations..

5.3 Style of Traffic Reporting

Based on the excerpts from Bay Area commercial radio traffic reports and on numerous reports listened to but not recorded, some initial impressions of Bay Area commercial radio traffic reporting were formulated. One issue which is not reflected in the transcriptions is the clarity of radio traffic reports. In general, radio traffic reporters have a rapid delivery style. While it is difficult enough to understand the content of a traffic report when reading a transcription, it can be significantly more difficult to accurately decipher traffic reports as they are being broadcast. The numerous descriptors (e.g., route numbers, directions, street names) contained in traffic reports, coupled with the rapid delivery style, make it a challenge to comprehend radio traffic reports.

Due to the fact that radio traffic reports are, for the most part, are delivered under strict time constraints, traffic reporters often formulate sentences which are sometimes incomprehensible to those who are not familiar with the area. In an attempt to fit as much information as possible within the allotted time of a traffic report, reporters often inadvertently run unrelated messages together, requiring the listener to determine where one message ends and the other begins. Very little information regarding queue lengths, travel time delays, estimated lane blockage durations, alternative route recommendations and other related information is provided in radio traffic reports.

6. CONCLUSION

The paper has investigated the attributes associated with radio traffic reporting in the San Francisco Bay Area. Of the **62** radio stations contacted **32** stations responded to the survey. According to the survey, morning traffic reports are broadcast most often with an average frequency of approximately 12 reports during morning peak hours (**6 AM-9 AM**)and the frequency of traffic reports varies somewhat by geographical location. In the North Bay Area, travelers receive a lower frequency of traffic reports relative to the entire Bay Area principally due to the lower population density and less severe traffic congestion. Frequency of traffic reporting is determined, in most cases, based on the availability of time slot in between programs. The length of most traffic reports is fairly short, between 15 and 20 seconds, and reports are typically followed by advertisements.

The content of the radio information generally focused on the qualitative flow rate, incident/accident locations, lane closure and the rail transit schedule. The flow rate is reported in qualitative terms (i.e., “moving slow”); little information regarding queue lengths, travel time delays, lane blockage durations, alternative route advice is provided in radio traffic reports. Detailed traffic information is often lost because of the inherent limitations of the information available to the traffic reporting companies themselves. One of the problems associated with radio traffic reporting is the vast coverage areas of many stations. Of those stations surveyed, approximately one half (15 stations) cover 100% of the Bay Area. Considering that a traffic report must cover an extensive road and transit network, little time is allowed for significant details to be provided in conjunction with any single incident. The most significant limitation of radio traffic reports from the perspective of the general public appears to be the limited scope and depth of the information reported as it pertains to an individual traveler’s particular trip.

Figure 1. Morning Radio Traffic Reports

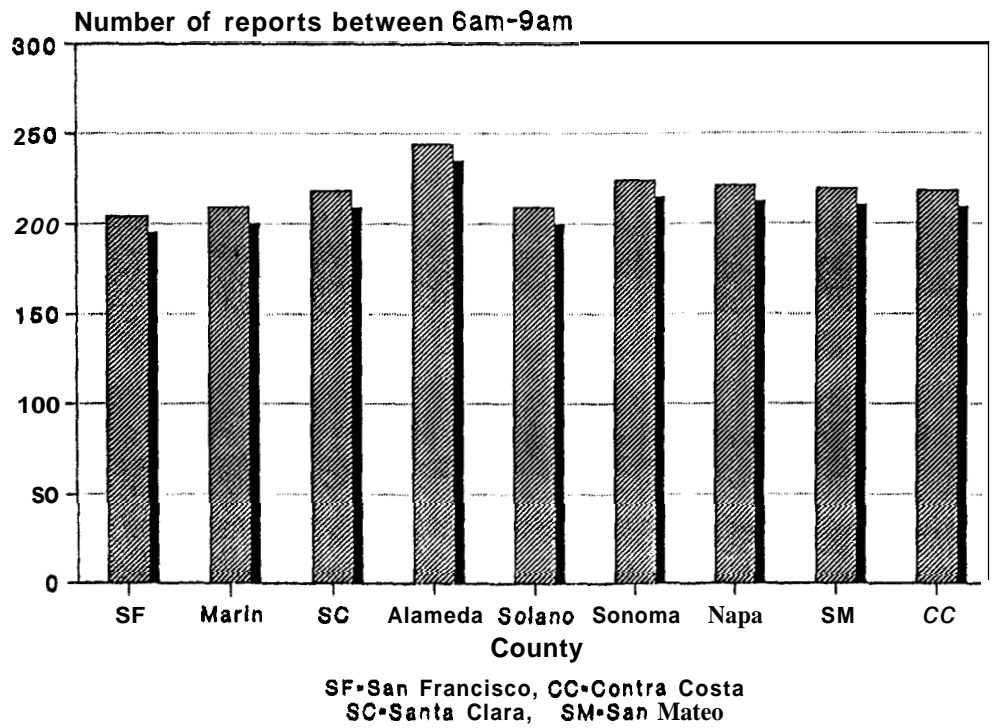


Figure 2. Daily Radio Traffic Reports

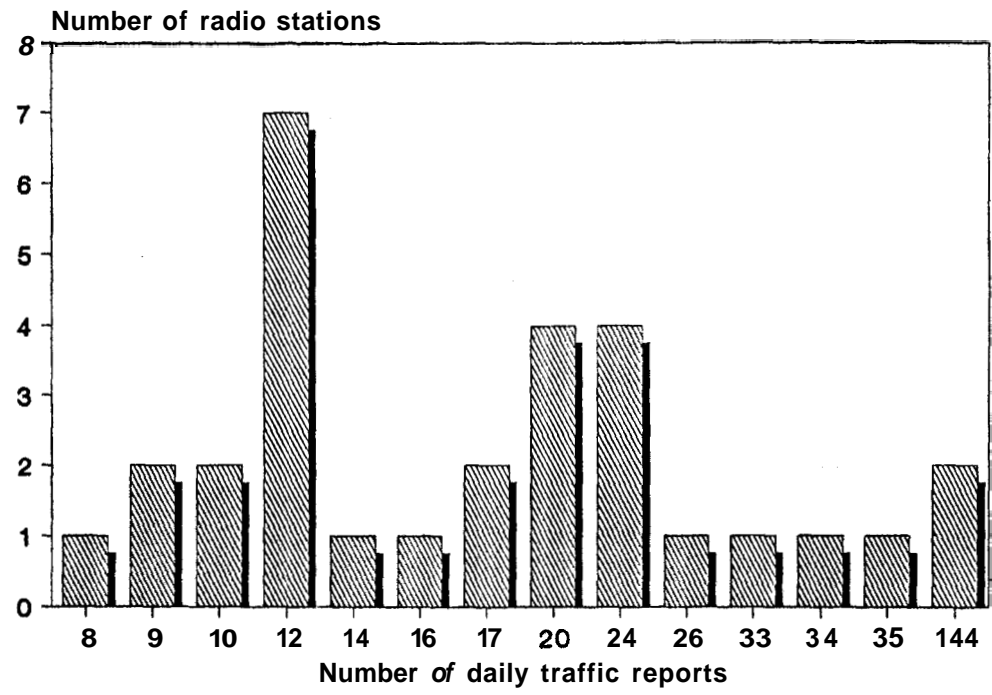


Figure 3. Program Type and Frequency of Traffic Reports

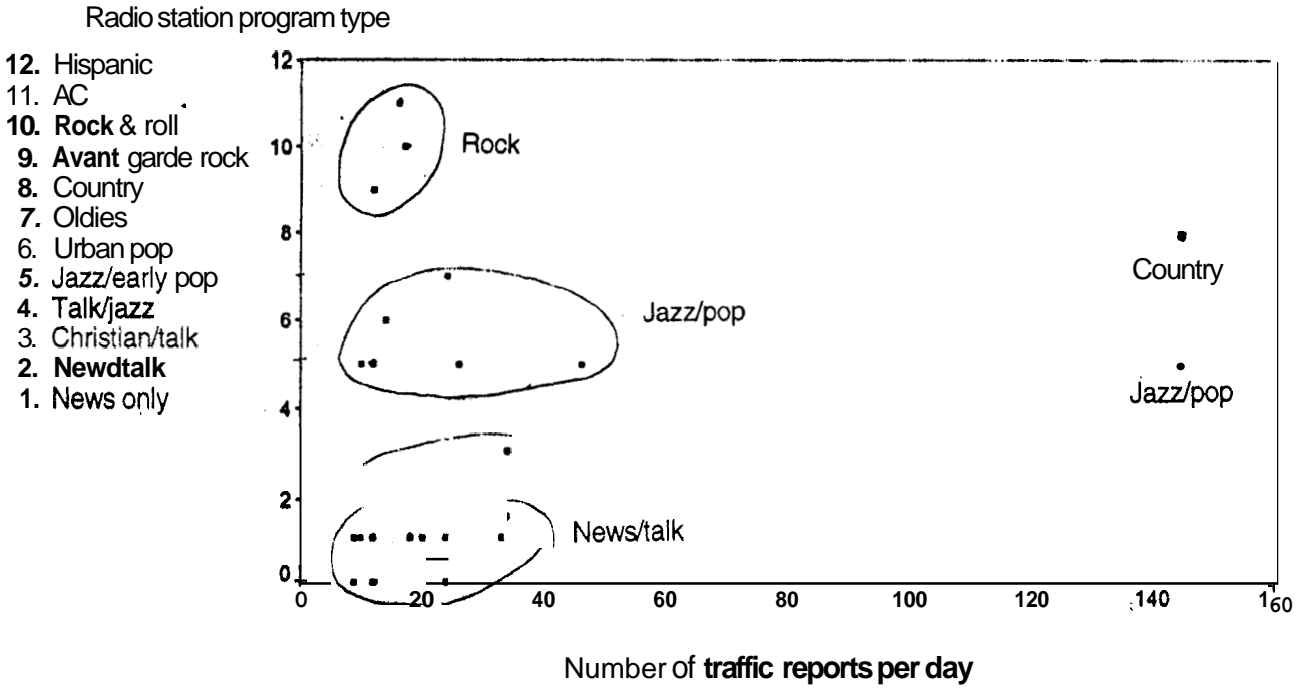
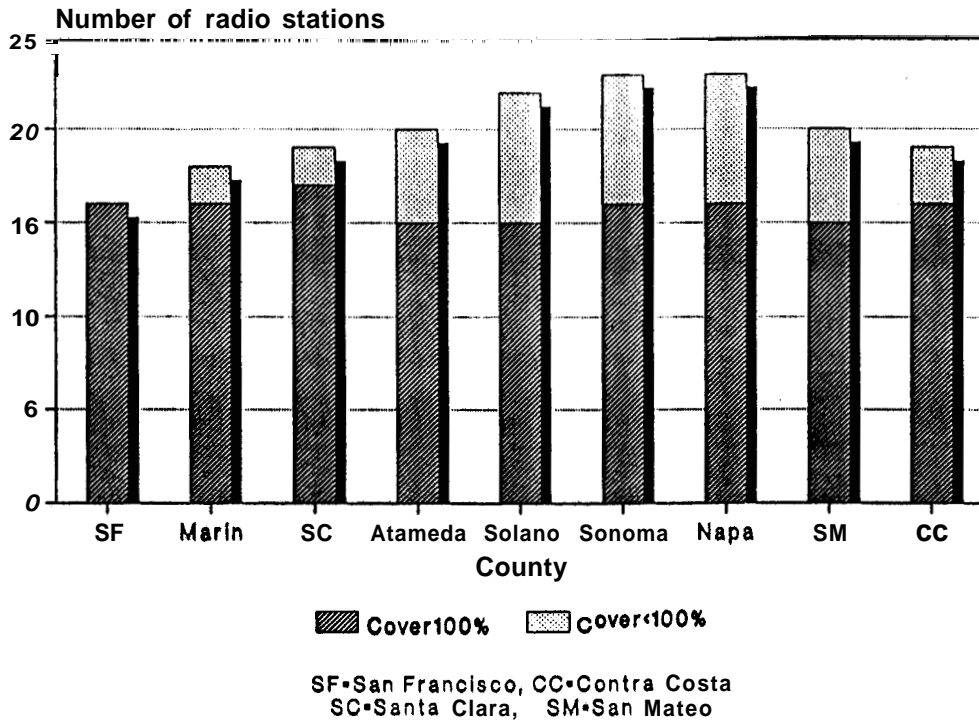


Figure 4. Station Report Coverage



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APPENDIX A. Radio Station Survey Instrument

The following outline was used to interview program directions of radio stations.

1. Collection and dissemination method of traffic information:

- What is your source of traffic information? How many information sources do you use?
- Does Metro/Shadow Traffic broadcast directly for you, or do you take their information and announce it yourself?
- Do you edit any of the information Metro/Shadow gives you?
- Can you list the times and or frequency of traffic information?
- How have you arrived at this frequency? That is, how have you come to understand listener needs and desires regarding traffic information in order to make the decision of frequency?

2. Sequence and duration of reporting:

- What surrounds your traffic reports? music or advertisements?
- Do you do anything, or need to do anything, to keep listener attention for a traffic report?
- How long are your reports?

3. Marketing strategies:

- How important is style vs. content of information to your listeners?
- Do you keep listeners or lose listeners during traffic information reports?
- Do you conduct surveys Bay Area listeners to develop marketing strategies?