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Highway Advisory Radio (HAR) Systems

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16. Abstract

Highway Advisory Radio (HAR) is a broadcasting system used by transportation agencies to disseminate vital real-time traffic information to motorists. Each transmitter is restricted by the rules and regulations of the Federal Communications Commission (FCC) to an average broadcast radius of three to five miles. Most commonly these transmitters are located at major highway intersections, such that motorists may take alternate routes in case of congestion or emergencies. All operational HAR transmitters in New Jersey were identified and their coverage zones were quantitatively characterized in terms of the signal to noise ratio at the receiver. These experimental results were then compared to subjective qualitative audio reception, and detailed maps of HAR coverage zones along New Jersey highways were generated. Knowledge of current deployments of HAR around the country, and information concerning availability and pricing by vendors, were compiled. Finally, recommendations for existing and future implementations of HAR systems in the State of New Jersey were made.

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SUMMARY

Highway Advisory Radio (HAR) is a broadcasting system used by transportation agencies to disseminate vital real-time traffic information to motorists. Each transmitter is restricted by the rules and regulations of the Federal Communications Commission (FCC) to an average broadcast radius of three to five miles. Most commonly these transmitters are located at major highway intersections, such that motorists may take alternate routes in case of congestion or emergencies. All operational HAR transmitters in New Jersey were identified and their coverage zones were quantitatively characterized in terms of the signal to noise ratio at the receiver. These experimental results were then compared to subjective qualitative audio reception, and detailed maps of HAR coverage zones along New Jersey highways were generated. Knowledge of current deployments of HAR around the country, and information concerning availability and pricing by vendors, were compiled. Finally, recommendations for existing and future implementations of HAR systems in the State of New Jersey to meet the needs of motorists were made.

INTRODUCTION

Objective

The objective of this report is to present the current and suggested future implementations of Highway Advisory Radio (HAR) systems within the State of New Jersey. Potential benefits of HAR systems are summarized considering state-of-the-art options of various configurations. All operational HAR systems in New Jersey were identified, their coverage zones were quantitatively characterized in terms of the Signal to Noise Ratio (SNR) at the receiver. RF performance of tested HAR systems was then compared to a subjective qualitative audio reception standard. Detailed maps of HAR systems tested are presented containing quantitative RF performance data. HAR systems operational in other states were identified and key aspects were outlined. The major HAR equipment vendors were contacted and their current capabilities and offerings were identified. Finally, suggestions in terms of new HAR installations as well

as improvements and changes in some existing systems for the State of New Jersey are recommended.

HAR systems, their potential benefits, and their current implementations in various states are summarized. Federal Communications Commission (FCC) regulations pertaining to HAR system licensing and operation are also included. Technical characteristics of current HAR systems, offerings by various vendors, and comparative pricing of different systems are determined. The experimental setup used for Radio Frequency (RF) characterization of current HAR systems in New Jersey is outlined. Experimental results corresponding to signal strength along the intended routes are presented for all existing operational HAR systems in the state. Operational procedures for these systems are summarized. Frequency interference and coordination issues for HAR systems such that similar systems operated by different agencies can co-exist within the State are discussed. Suggestions for a future implementation of HAR systems in the State of NJ considering the availability of various options are made.

Background

By the 1970's, it became evident that traffic would become more of a problem every year. With increased numbers of motorists, the importance of disseminating information concerning delays, construction areas, and other hazards on the road became ever more important to ease congestion and to increase safety. It was clear that the easiest way to reach the largest possible audience was to utilize the commonly used commercial AM/FM broadcast receiver present in motorists' vehicles. In 1977, the FCC allocated two frequencies, 530 and 1610 kHz for HAR applications. Since then, the FCC, under Part 90.242 of its Rules and Regulations, has authorized local and state governments to broadcast information on any open AM band between 530 and 1700 kHz. The FCC limits broadcast power of HAR transmitters to ten watts with a maximum field strength of 2 mV/m at 1.5 km from the antenna, and limits the tip of the antenna to a maximum of fifteen meters off the ground. Additionally, the HAR station must operate as secondary to any commercial radio stations in the area, and must not interfere with

such stations [1]. With these rules in place, the average HAR transmitter signal can reach a receiver three to five miles away [2]. However, the FCC does not limit the number of stations, hence a larger area can be covered by multiple transmitters. Although the basic idea of HAR has remained intact throughout the years, recent advances in electronics and refinement of operating procedures have changed the way HAR is utilized. These innovations have made significant advances in the way the HAR systems are managed, and have improved the quality of the service. Some of these advancements are outlined below:

- Wired and wireless access to change messages,
- Digital recorders to store received messages,
- Novel circuitry to eliminate noise and improve message quality,
- Computer controlled centralized operation,
- Remote diagnostic capabilities to expedite trouble shooting,
- Solar powered operation to reduce installation and maintenance costs,
- Mobile units to respond to emergency incidents,
- Synchronization between adjacent stations to eliminate co-channel interference,
- Antenna options for site specific needs,
- Better ground availability for more efficient operation at the antenna sites,
- Signs and messages for alerting motorists.

The purpose of Highway Advisory Radio was originally, and still is, to disseminate critical traffic and emergency information to motorists. Although the FCC has allocated the AM radio band to HAR, other means of disseminating information to a wide motorist audience using advisory radio exist. For example, other possibilities also considered for the State of New Jersey include: purchasing two commercial radio stations for state wide coverage, low power FM stations, and low power, localized, AM band HAR stations. There are advantages and disadvantages for these options. For the purchasing of statewide commercial radio stations, the main advantages include the centralizing of the system management, operation, and data collection. Real time data can be effectively disseminated over a wide area to the public and the public needs to

know only the frequency of this one station to receive information about any roadway or transportation system within the State. Disadvantages include the high cost of purchasing and operating such stations, determining the usage of the station during off-peak hours, and, for the public, having to listen to information for the entire State when they are interested in only one specific roadway or area.

Low power FM stations might be the distant future of HAR if it were not for the saturation of the band by commercial stations in New Jersey. The FCC is currently implementing rules for such stations for HAR purposes, however, licensing will be competitive, and waiting periods are long. The other disadvantage of low power FM is that it requires 150 watts broadcast power to cover approximately the same area as a 10 watt AM HAR station [(2)]. Therefore, solar power would not be feasible.

Low power AM radio transmitters are commonly used for non-profit organizations or advertising real estate. They have a very limited range of approximately a quarter of a mile [(3)]. However, they do not require a license and are very inexpensive.

Highway Advisory Radio has been successfully implemented in many other states, including Minnesota, which instead of using multiple low power transmitters, has partnered with Minneapolis Public Schools, and broadcasts traffic information on a high power public radio station on the FM band during peak travel hours and emergencies, and Jazz music during off peak hours [(4)]. California has merged HAR with an advanced Intelligent Transportation System (ITS), where the roadway is monitored via cameras and sensors. ITS operators disseminate this information via HAR, telephone, television, and are currently researching FM subcarrier technology [(5)]. FM subcarrier transmission would utilize unused bandwidth of commercial radio stations, however it requires use of a special receiver not yet commonly available for the general public's use. Rhode Island uses a total of four HAR transmitters on all major interstate corridors, and many state routes [(6)]. The state of Illinois uses HAR transmitters that use synthesized voice transmitters, where operators need only to type messages. Additionally, the system accepts data from highway sensors, and changes messages automatically based on

road conditions [7]. Montgomery County in Maryland runs a cable television station that broadcasts traffic information, and uses twelve HAR transmitters near interstate highways covering ten percent of the county's land area [8].

HIGHWAY ADVISORY RADIO (HAR) SYSTEMS

The State-of-the-Art

Current options in Highway Advisory Radio (HAR) equipment range from basic units to the state-of-the-art. Transmitters range from $5,000 units to practically limitless possibilities of various options. Although there are many configurations for HAR transmitters, most share the basic block diagram as shown in Figure 1.

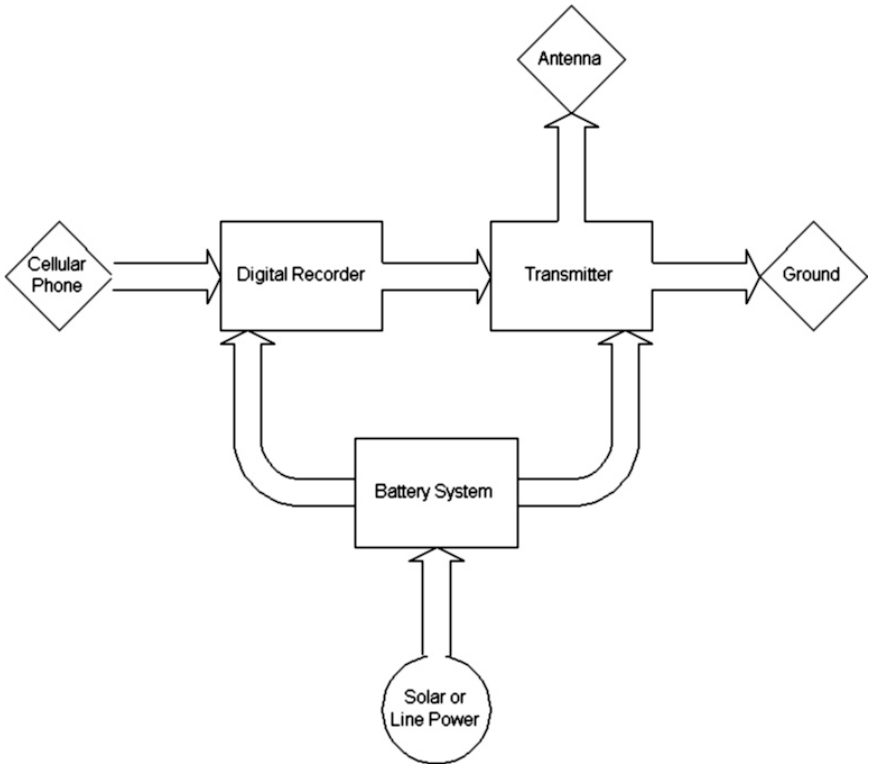

Figure 1. Typical Transmitter Block Diagram

Basic Transmitters

One group of Highway Advisory Radio transmitters can be classified as the basic, or economy group. These fixed transmitters are pole-mounted, with buried ground systems and cannot easily be moved once they are installed. Furthermore, licensing of a fixed transmitter requires field strength maps for its proposed location. They are well suited for high volume corridors, large highway intersections, and identified problematic areas of highways. They can also be installed near complicated highway intersections and ramps where people are likely to become confused. A typical basic transmitter is shown in Figure 2.

Figure 2. Typical Basic Transmitter [2]

Basic Transmitter Options

Basic HAR transmitters come in a variety of forms, with a variety of options. Digital recording is standard on all modern units. This means that the transmitted audio is stored in digital format, usually flash memory or some other zero moving part device. This has advantages over analog storage in terms of improved reliability and audio quality. Most transmitters are capable of ten watts transmitting power, the maximum output power for HAR permissible by the FCC. However, some manufacturers claim that excess transmitting power yields improved reliability and so offer higher power units such as 30 watts capable transmitting power.

The National Oceanic and Atmospheric Administration (NOAA) broadcasts weather

information which can be received by some HAR transmitters and automatically repeated on the AM band when there is a weather emergency. Another option is to operate multiple transmitters in unison, i.e., a synchronized system. This allows multiple ten watt transmitters to cover a large area with overlapping, but not interfering signals. Other common options on basic HAR transmitters include: a cellular phone, so that a land line telephone is not required, battery backup, so that the transmitter can transmit for hours in the event of power outages, and solar panels, which permit installation with no electrical connection. Touch tone controls allow easy message checking and changing from any telephone. Without these options, however, it is possible to find a complete transmitter for approximately $5,000. Most vendors also provide turnkey installation for an additional cost.

Basic Transmitter Vendors

LPB Communications, Inc.[3]

Classic Fixed Highway Advisory Radio Transmitter:

- Digital Recording,
- Capable of 30 Watt Operation,

Options:

- Synchronized Systems.

Highway Information Systems [9]

Highway Max:

- Digital Recording,
- Battery Backup.

Options:

- Computer Control,
- Solar Power,
- Cellular Phone.

Information Station Specialists (2)

Traveler's Information Station:

- Digital Recording,

No options.

Alert AM:

- Superior Digital Recording,
- Automatic NOAA Weather Information,
- Pre-recorded Messages can be automatically played by external interrupts.

Transportation Intelligence, Inc. (10)

Stationary Highway Advisory Radio Transmitter:

- Digital Recording,
- 10 Watt Power.

Options:

- Battery Backup,
- Solar Power,
- Cellular Phone.

Mobile Transmitters

Fixed transmitters offer inexpensive solutions to troublesome areas of the highway, however, mobile transmitters offer the most flexibility with positioning transmitters. These transmitters can be hitched to most official vehicles, including police vehicles, and can be towed to the scene of accidents, construction areas, events, or other places where disseminating information to drivers in the area will alleviate congestion and stress, and also enhance safety. Adequate and timely information will ease congestion by allowing drivers the option to take alternate routes. Licensing of mobile HAR transmitters is usually done on the state wide level, and the usual field strength analyses can be avoided. Most vendors will assist with licensing arrangements, and these units can be in service within five minutes after being towed to their destination.

The disadvantage of mobile transmitters is that portable signs alerting the public to their presence must also be brought to the area. Figure 3 shows a typical mobile transmitter.

Mobile Transmitter Options

Mobile HAR transmitters come with few options. As it is unlikely power can be found nearby, solar power is usually standard. Additionally, solar power is desirable because then a generator need not be carried with the unit. Mobile transmitters come with two types of antenna systems: frequency agile or dual antenna. Frequency agile means

Figure 3. Typical Mobile HAR Transmitter [9]

that the transmitter is easily tunable and can be operated at any frequency in the AM range. Dual antenna systems can operate at either low or high frequencies and are factory tuned. Computer control allows the same mobile transmitter to receive new messages by remote computer, and thus be part of a network of transmitters, or part of an Advanced Transportation Management System (ATMS).

Mobile Transmitter Vendors

<u>Highway Information Systems</u> [9]

Solar Max:

- Solar Power,
- 2 Complete Transmitters and Antennas for High and Low Frequency Operation,

- Cellular Phone.

Options:

  - Computer Control.

Information Station Specialists [2]

RoadRunnR:

- Solar Power,
- Frequency Agile,
- Cellular Phone,
- Licensing, Delivery, and On-Site Training Included.

Options:

  - 2X Recording Time.

Transportation Intelligence, Inc. [10]

Mobile Highway Advisory Radio Transmitter:

- 2 Complete Transmitters and Antennas for High and Low Frequency Operation,
- Cellular Phone,
- Touch-Tone Controls.

Options:

  - Solar Power.

Advanced Transmitters

Although the above systems work well alone at intersections and problem areas, a state-of-the-art Advanced Transportation Management System (ATMS) requires state-of-the-art HAR transmitters. The economy transmitters require that someone call up the cellular phone on the unit itself and speak the new message onto the transmitter. The transmitter will then repeat the message until the message is once again changed. For a large system of HAR transmitters, changing messages can easily become someone's full time job. Also, messages may not be changed back to standby information messages after the problem is cleared, and people will start to lose interest in the HAR

system and stop listening. The same problem can be said about HAR sign controllers. To alleviate these issues, advanced Highway Advisory Radio transmitters and systems have been developed that automate and organize message placement. This class of transmitters is very broad, available with many different options, and is usually custom built by the vendor to customer specifications. Such systems can digitally upload messages to transmitters, store pre-recorded messages on file, or even automatically change messages when interrupts, such as road loop detectors, sense stalled traffic. Below some prepackaged offerings from vendors are summarized.

Highway Information Systems [9]

DR2000 and DR2000D:

- Centralized Computer Controller,
- TCP-IP "Internet" Control,
- Up to 50 Station Control,
- Analog and Fully Digital Versions Available,
- Software Only.

Black Max:

- Modular Highway Advisory Radio Transmitter,
- Digital Recording,
- Upgradable,
- Weather Information,
- Compatible with DR2000.

Information Station Specialists [2]

ITS.6000:

- Intelligent Highway Advisory Radio Network,
- Computer Controlled HAR Network,
- Can Synchronize Multiple HAR Transmitters.

Options:

- Flashing Signs
- Extra High Signal Strength Antenna System
- Digital Transfer of Messages

Services

All reputable vendors of HAR equipment provide some technical services, and some provide a complete service, including licensing of transmitters and site planning. Below some examples of services are listed, with pricing information provided in the next section.

Highway Information Systems [9]

- Turnkey Installation,
- Full Technical Services including:
  - FCC Frequency Search,
  - On-site Repair and Training.

LPB Communications, Inc. [3]

- Turnkey Installation,
- TIS/HAR Licensing.

Transportation Intelligence, Inc. [10]

- Turnkey Installation,
- System Planning and Consulting.

Information Station Specialists [2]

- Site Choice and Frequency Monitoring Service,
- Frequency Search and FCC Licensing Assistance,
- On-site Training.

Vendor Pricing

LPB Communications [3]

Classic Fixed Highway Advisory Radio Transmitter:

$5,000 - $9,000, $20,000 for complete system with turnkey installation.

FCC TIS/HAR Licensing and Engineering Services:

$1,000.

Highway Information Systems [12]

Highway Max:

$25,000 - $30,000.

Solar Max:

$45,000.

DR2000 and DR2000D:

$25,000 for 1 server and 5 workstation licenses.

Information Station Specialists [11]

Traveler's Information Station:

$10,000 - $12,000 with turnkey installation.

Alert AM:

$15,000 - $17,000 with turnkey installation.

RoadRunnR:

$24,995 + $1,240 for 2X recording time.

ITS.6000:

$13,326 - $30,765 for 1 station + $1,495 for software.

Transportation Intelligence, Inc. [10]

Stationary Highway Advisory Radio Transmitter:

$9,335 - $17,245.

Mobile Highway Advisory Radio Transmitter:

$35,500 - $39,995.

Turnkey Installation:

$3,575.

HAR COVERAGE ZONES

HAR Coverage Determination

By determining the geographical areas and broadcast frequencies of current HAR coverage, areas requiring additional coverage can be identified, and frequencies at which they would not interfere with one another can be determined. Additionally, areas with coverage that was previously not expected can be discovered, and detailed information regarding that coverage zone can be utilized to modify and expand the locations of HAR signs notifying the pubic of their broadcast.

Unfortunately, detailed maps of HAR coverage zones do not exist for the State of New Jersey. While all agencies owning fixed HAR transmitters are required to file field strength contour maps at the time of licensing, these maps give only field strength data, and are usually estimations generated prior to installation of the station. Therefore, they are not based on actual measurements. In order to generate meaningful maps of HAR coverage zones, it is also important to take into account the ability of motorists' vehicles to receive the transmitted message.

Test Equipment

It was determined that the optimal way to collect information concerning coverage zones was to install equipment in a test vehicle and then drive it on major roads around HAR stations. The equipment was used to record the Signal to Noise Ratio (SNR) of all HAR stations operated by various State agencies. To facilitate the data collection, software was written in LABVIEW on a PC compatible laptop computer, whose purpose was to control the hardware, and to collect data from the equipment.

The equipment used was an Anritsu spectrum analyzer type MS710D and a Travroute CoPilot 2000 Global Positioning Satellite (GPS) receiver. Data from these two sources was then collected by custom software on the laptop computer. The spectrum analyzer was connected to the computer via a National Instruments PCMCIA GPIB card, while

the GPS unit was connected by serial link and powered by the laptop through the PS2 port. The spectrum analyzer was connected to a custom built, 72 inch monopole antenna mounted to the roof of the test vehicle. All of this equipment was powered by a 400 watt static inverter connected to the battery of the vehicle. Figure 4 shows a block diagram of the equipment used for the tests.

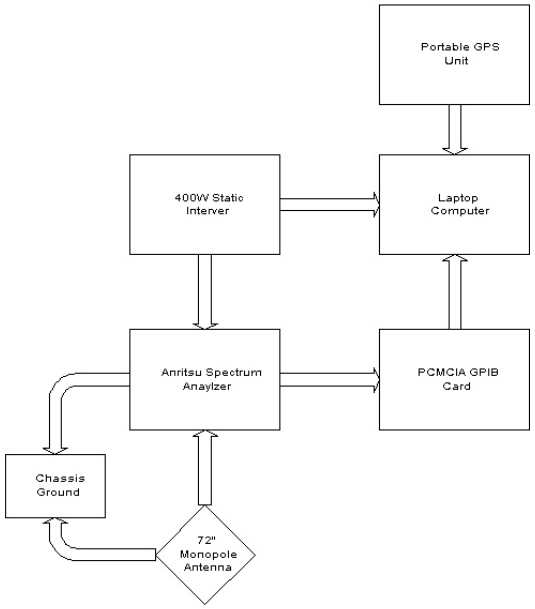

Figure 4. Equipment Block Diagram

The antenna itself is a 72 inch long, 1/4 inch diameter steel rod fitted to a bolt that screws in to the mount. Due to its thickness, it remains almost entirely vertical even at highway speeds, however, it requires a strong mount to resist aerodynamic forces. The antenna bracket was custom made, and is able to be attached or removed from the vehicle in under five minutes. It has two ground straps to connect it to the vehicle chassis. It was found that the bracket could easily support the antenna traveling over 60 mph. A coaxial cable then connects the antenna to the spectrum analyzer. As seen in Figure 5, the GPS unit (white, flat, circular device on roof of vehicle) was placed on top of the vehicle, as it needs to have direct access to the sky for proper reception. Figure 6 shows the spectrum analyzer and computer.

Figure 5. Antenna

Figure 6. Computer and Analyzer

Test Software

Custom software was written for this test, including drivers for both the GPS and the spectrum analyzer, as none were available. The software was written in a data flow

language called LABVIEW. A screen shot of the main screen is shown in Figure 7.

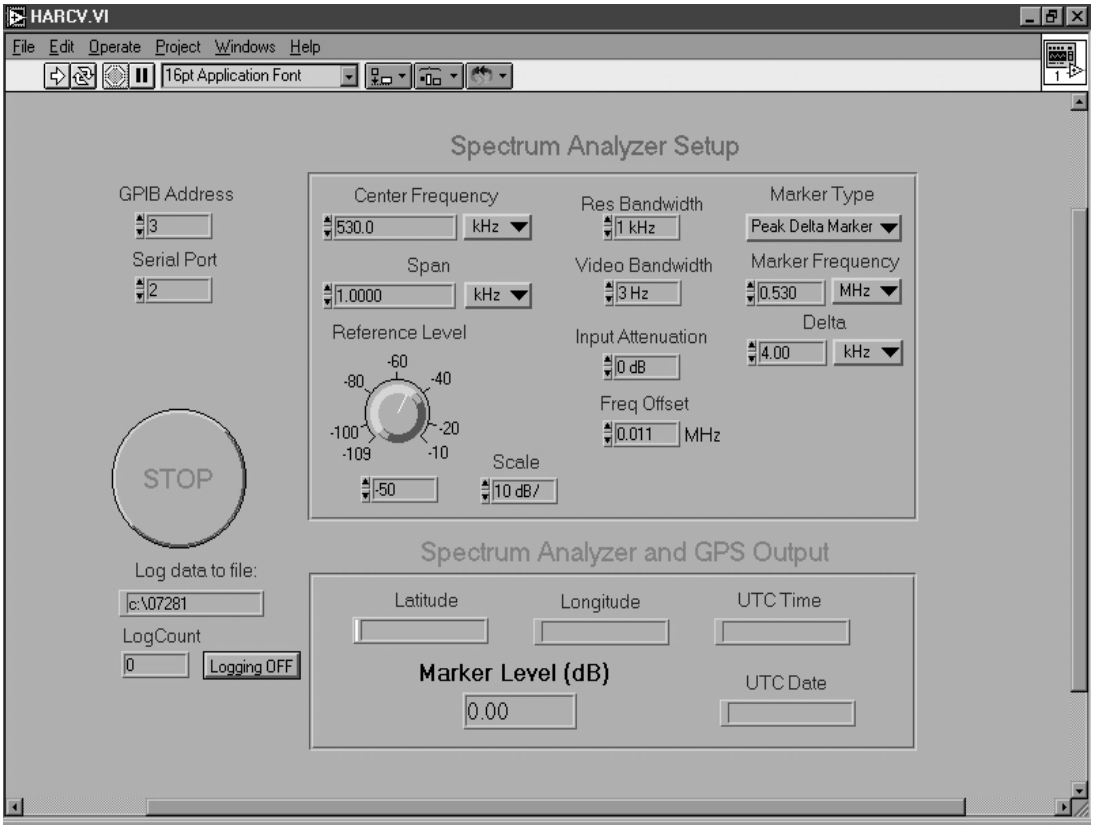

Figure 7. Software Main Screen

The manner in which the software operates is as follows. First, the spectrum analyzer is set up as specified on the main screen at time of startup. After this is done, the software enters a loop, where, step one checks the spectrum analyzer to see if settings have changed since the last iteration, and adjusts as needed. Step two acquires a data point from the analyzer using one of the four techniques selected by the user. Step three acquires geographical coordinates from the GPS unit along with the current date and time. The final step before repeating the loop logs the data from both sources into the specified file. With the configuration used for the test, data points were acquired every 24 seconds. 3093 valid data points were collected in the State, requiring more than 1800 miles of driving. Figure 8 shows a flow chart of the software's functions.

The software was written with multifunction in mind, and testing can be done on significantly higher frequencies, simply by changing software settings. Thus, the same software and equipment can measure SNR of almost any transmitting system. This

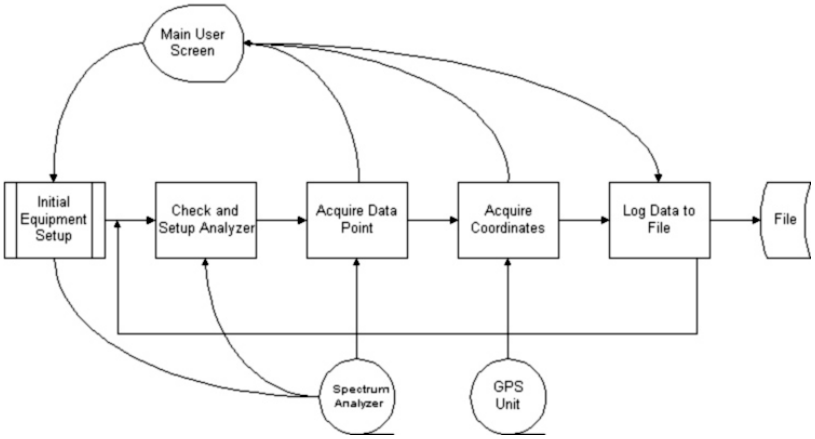

Figure 8. Software Flow Chart

feature made it especially easy to change frequencies when measuring stations broadcasting on different frequencies. An additional feature was added to the software to compensate for temperature drifts and miscalibration of the spectrum analyzer. This feature allows the operator to quickly compensate for such changes every day and get more accurate readings.

HAR Stations in New Jersey

Twenty-three HAR transmitters in New Jersey operated by various agencies were tested. Additionally, a station broadcasting from Wilmington, Delaware was also studied. The data for stations is contained in individual files. Some runs contain information for several transmitters broadcasting on the same frequency. Table 1 shows the tested stations, frequencies, call signs, locations, and raw data filenames.

A Traveler's Information Station (TIS) owned and operated by Rutgers University and a not yet operational HAR system in Monmouth Beach were not surveyed. A naming schedule based on the date of the test, and a sequential number for that day was used for file names. Thus, the first transmitter(s) tested on 07/03, would be given a file name

of 07031.TXT for the data file, and 07031.SET for setup information for that run. The next test that day would be 07032.TXT and 07032.SET, respectively.

Township	Frequency	Call sign	Location	File
New Jersey Turnpike Authority				
Carneys Point	1610 kHz	WPEI435	Exit 1	07031.TXT, 09051.TXT
Bellmawr	1610 kHz	WPEI435	Exit 3	07031.TXT, 09051.TXT
Mount Laurel	1610 kHz	WPAS758	Exit 5	07031.TXT, 09051.TXT
Bordentown	1610 kHz	KPB688	Exit 7	07031.TXT, 09051.TXT
Jamesburg	1610 kHz	WPAS758	Exit 8A	07031.TXT
Woodbridge	1610 kHz	WPFQ441	Exit 11	07031.TXT, 09042.TXT
Elizabeth	1610 kHz	WPAS758	Exit 13A	07031.TXT
Jersey City	0590 kHz	WPFP980	Exit 14B	09041.TXT
North Arlington	1610 kHz	WNWN396	Exit 16W	08032.TXT
Fort Lee	0590 kHz	WPFP979	I-95 North of Exit 18W	08031.TXT
New Jersey Department of Transportation				
Parsippany	0530 kHz	KNNI707	I-80 at I-287	07301.TXT
Paramus	0530 kHz	KNNI707	NJ-4 at NJ-17	07311.TXT
Elmwood Park	0530 kHz	KNNI707	I-80 at NJ-17	07311.TXT
Totowa	0530 kHz	KNNI707	I-80 at US-46 and NJ-23	08011.TXT
Parsippany	0530 kHz	KNNI707	I-80 at I-280	08011.TXT
Allamuchy	0530 kHz	WNPX698	I-80 at Allamuchy	07302.TXT
Edison	1340 kHz	WPKM210	US-1 at I-287	08021.TXT
Lawrence	1380 kHz	WPKM210	US-1 at I-295	08033.TXT
Carneys Point	0830 kHz	WPKN262	I-295 near Delaware	09052.TXT
Garden State Parkway				
Hamilton	1610 kHz	WQO799	Exit 98	07281.TXT
Port Authority of New York and New Jersey				
Newark	0530 kHz	WNDF923	Newark Airport	08061.TXT
Union Beach, Sandy Hook				
Union Beach	1610 kHz	WPIJ669	NJ-36 and Sandy Hook	09042.TXT
Atlantic City Convention Center and Visitor's Authority				
Pleasantville	1610 kHz	WPIR381	ACE Toll Plaza	09054.TXT
Delaware Department of Transportation				
Wilmington, DE	1380 kHz	KPKW685	Near DE Memorial Bridge	09053.TXT

Table 1. Tested HAR Stations

Measured data from the HAR transmitter tests is included as Appendix A of this report. The data is organized as a series of entries, one for each data point, separated by a carriage return. Individual data points are represented as a collection of entries, comma delimited. The first entry is the number of the data point. The second and third entries

are the latitude and longitude, respectively. The final entry is the marker level, or SNR, in decibels. The .SET files contain information on the start and stop times of the runs, and also the broadcast frequency. These files are attached before each data set in Appendix A, Page 34.

HAR Coverage Map

In order to plot the data from the stations in Table 1 meaningfully, the data from the spectrum analyzer needs to be matched to real world parameters. Using the vehicle's AM/FM radio, the operator listened to the HAR station subject to testing and subjectively determined the minimum SNR that the audio signal could be properly received. It was found that the level depended on a variety of factors, such as the time of the day, frequency, and location of the test. However, most transmitters were found to have a minimum SNR for adequate reception in the range of 15-19 dB. Data in the file 07031.TXT was found to be 10 dB because a smaller, less sensitive antenna was used for that particular test, and file 08032.TXT is 23 dB since a commercial broadcasting station interferes considerably with the transmitter. Data for the minimum SNR for adequate reception is listed in Table 2.

File Name	Decibels
07031.TXT	10 dB
07281.TXT	16 dB
07301.TXT	18 dB
07302.TXT	13 dB
07311.TXT	18 dB
08011.TXT	18 dB
08021.TXT	18 dB
08031.TXT	16 dB
08032.TXT	23 dB
08033.TXT	17 dB
08061.TXT	15 dB
09041.TXT	16 dB
09042.TXT	17 dB
09051.TXT	18 dB
09052.TXT	16 dB
09053.TXT	19 dB
09054.TXT	16 dB

Table 2. Minimum SNR for Adequate Reception

Using a mapping software called ESRI ArcView, the data from Appendix A was mapped onto road maps with data shown as colored dots. The color of the dot represents the intensity of the signal at that point. Yellow represents points where the station was not receivable, green shades indicate a gray zone where the signal may or may not have adequate reception based on individual vehicle's equipment. Blue shades represent clear reception. Appendix B, Page 53 contains the full color maps for each file. It is important to note that areas in green cannot guarantee that vehicles will be able to receive the signal, as it is dependent on parameters such as past and current weather, time of the day, and the vehicle's radio quality. A sample map of the Garden State Parkway near Exit 98 is shown in Figure 9.

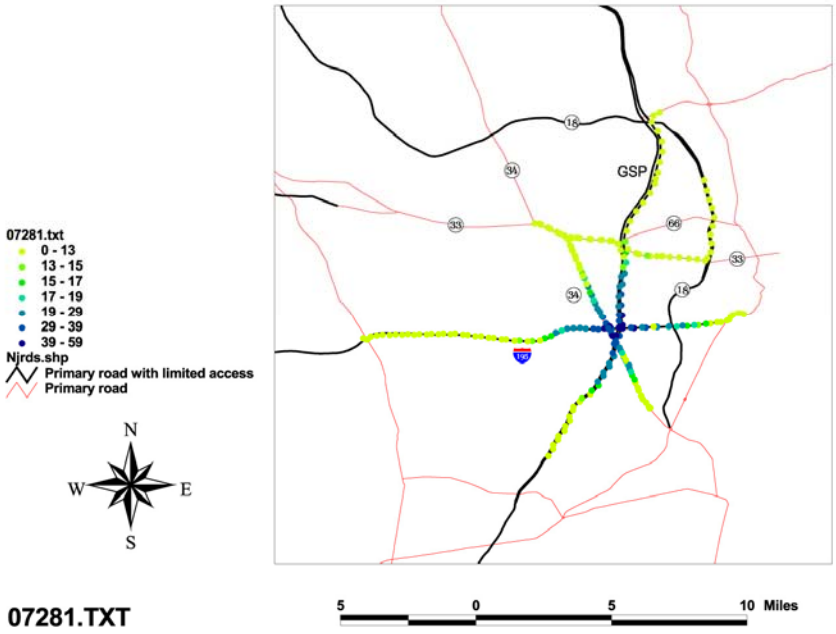

Figure 9. Sample Map of GSP Exit 98

It was determined that the expected three to five miles radius for an HAR station is generally higher than experimental data obtained in the State of New Jersey demonstrates. This is most likely due to heavy interference, many overhead wires, and poor grounding. Most transmitters transmitted adequate quality audio to two to four miles from the station, one as high as six to seven, and one was hardly a mile.

Therefore, it is very important to properly plan HAR sites, paying especially close attention to overhead wires and grounding. Interference from a commercial radio station prevented essentially any intelligible audio from being heard from the HAR transmitter in North Arlington, 08032.TXT. Therefore, it is important to properly survey proposed new sites, and continually monitor existing sites for possible interference.

RESULTS AND CONCLUSIONS

Existing Highway Advisory Radio (HAR) systems in New Jersey were identified. The coverage zones were mapped out using signal to noise ratio measurements combined with GPS equipment data. These measurements were compared qualitatively to standard AM reception to identify the coverage zones more adequately.

State-of-the-art hardware in HAR systems was identified, contacts were established with vendors and system integrators for information regarding pricing and availability of various options. Based on the outcome of HAR signal characterization tests in the State of New Jersey, candidate locations for future implementations were suggested.

Current Implementation of HAR Systems in New Jersey

A total of 24 HAR transmitters, of which 23 are in the State of New Jersey, were tested. Two additional transmitters were not included in this testing, one is Rutgers University's Traveler's Information System (TIS) and the other, in Monmouth Beach, is not yet operational. Ten transmitters subjected to testing are owned and operated by the New Jersey Turnpike Authority, nine by the New Jersey Department of Transportation (NJDOT), and five by other regional authorities. Five NJDOT transmitters are operated as part of the Metropolitan Area Guidance Information and Control (MAGIC) system. These transmitters, located along the I-80 corridor, transmit synchronized messages to cover a larger area than possible with individual transmitters. Those transmitters all use the common station identification "KNNI707". Figure 10 shows all 24 transmitters' coverage zones of adequate reception mapped against population density in New Jersey. Areas of blue indicate adequate reception quality, and darker shades of green

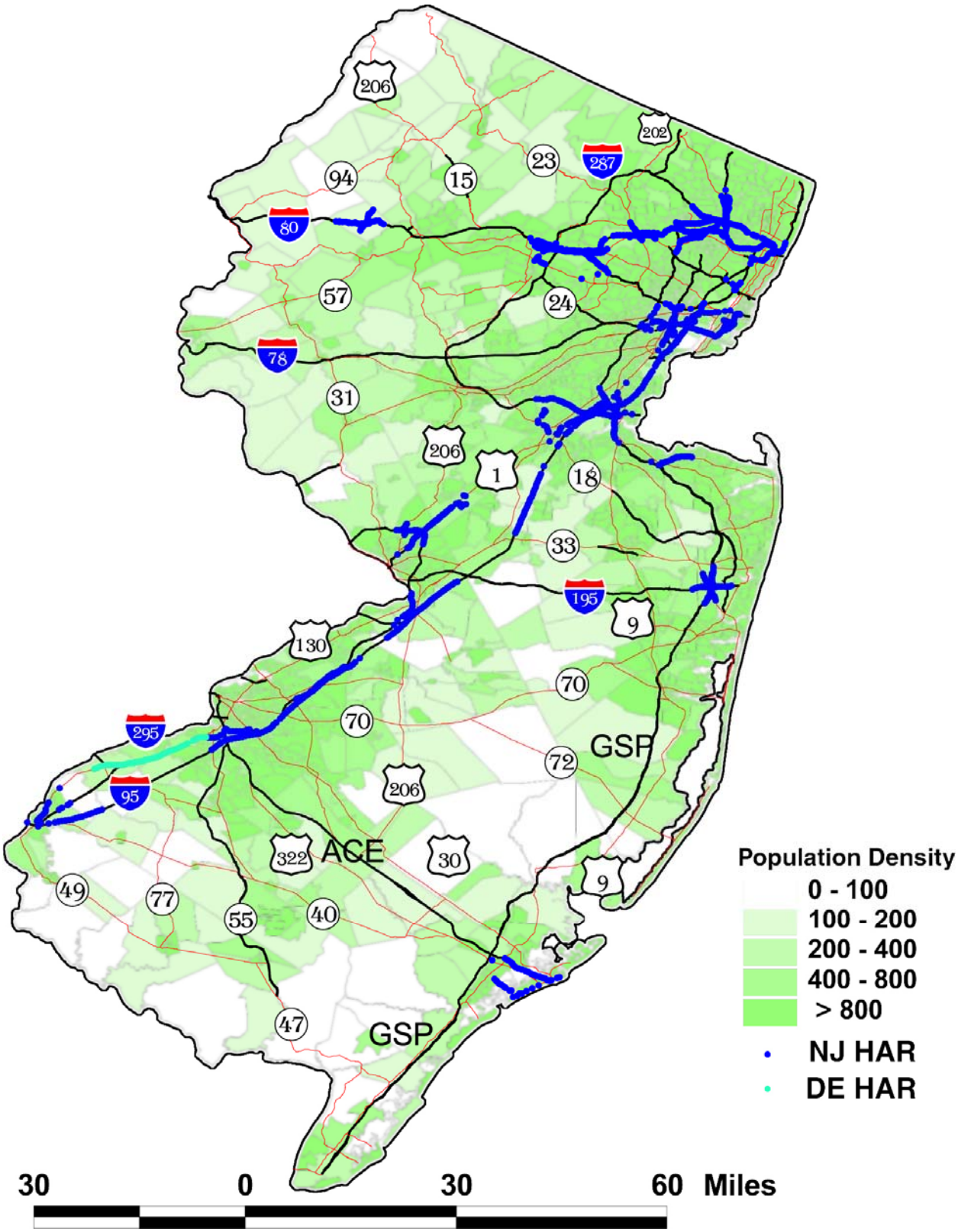

Figure 10. New Jersey HAR Transmitters: Coverage and Population Density

background indicate higher population densities, whereas lighter shades indicate lower population densities.

New Jersey Turnpike HAR Systems

Ten HAR transmitters are located along the New Jersey Turnpike at fairly regular intervals. They are located approximately at Exits 1, 3, 5, 7, 8A, 11, 13A, 14B, 16W, and north of Exit 18. All the transmitters have strong signals with large coverage areas, with the exception of the transmitter at Exit 16W, which has very poor radiation characteristics due to interference with a commercial broadcasting station. All transmitters south of Exit 7A on the turnpike can also be received on I-295.

The coverage zone of the HAR transmitter located near I-80 is shown in Figure B-5, Page 57 of Appendix B. The HAR transmitters located in the southern region of the New Jersey Turnpike have their coverage zones shown in Figure B-1, Page 53. Coverage zones in Figure B-4 and B-3 correspond to HAR transmitters located at Exits 16W and 14B, respectively. The minimum SNR's required for adequate reception are listed in Table 2, Page 20 by HAR transmitter. Minimum Signal to Noise Ratio for adequate reception depends on a variety of parameters, such as frequency, interference, and temperature. However, the test run 07031.TXT has an unusually low minimum SNR of 10, which is due to using a smaller, less sensitive antenna. This antenna was replaced with a better electrically matched, and mechanically robust antenna in subsequent tests.

The HAR transmitter located near Exit 1 of the New Jersey Turnpike is actually located at the service area near the exit. The transmitter's coverage nearly includes the Delaware Memorial Bridge, however, proper reception is limited to a short section of I-295 (see Figure B-1). The coverage zone of the HAR transmitter at Exit 3 includes portions of I-295, but it is not adequate to be received well on either the Walt Whitman or Ben Franklin bridges leading to Philadelphia. The transmitter at Exit 5 has a range of about six miles in either direction along the Turnpike. The coverage zone of the HAR

transmitter at Exit 7 is slightly lower, about five miles. The transmitter at Exit 11, can also be received very well along the Garden State Parkway (see Figure B-2, Page 54). The transmitter at Exit 13A and the transmitter at Exit 11 form a continuous extended coverage area. However, they do not broadcast the same synchronized message and consequently interfere with each other in a very short segment (less than a mile) of the highway. The transmitter located at Exit 14B (see Figure B-3, Page 55) transmits a clear signal all the way over the Pulaski Skyway, however, those areas of Routes 1&9 that run under other highways cannot receive the HAR signal, and no data for them exists, as the GPS receiver unit could not get a fix on the position during the test. The transmitter located at Exit 16W (Figure B-4) has very poor reception, likely due to interference from a commercial radio station broadcasting from New York City on the same frequency. The HAR transmitter north of Exit 18 (Figure B-5) broadcasts a strong signal that reaches all the way to I-80 near the George Washington Bridge, and can be well received by motorists on I-80, US-46, and NJ-4, but not on the Palisades Parkway, due to constraints in the geographical terrain.

New Jersey Department of Transportation Transmitters

The New Jersey Department of Transportation has a traffic management system called MAGIC, which synchronizes five transmitters along the I-80 corridor. These transmitters are located at the following locations: Paramus, Elmwood Park, Totowa, and two transmitters in Parsippany. These transmitters all broadcast the same message, and form a fairly continuous coverage zone. Coverage zones of HAR transmitters in the MAGIC program can be found in Appendix B, as Figures B-6, B-7, B-8, and B-9. The HAR transmitter at I-80 and I-287, shown in Figure B-7, demonstrates fairly weak signal strength. However, the HAR transmitter at I-80 and US-46, which is only four miles away, has a broader effective coverage zone with a clear signal. The transmitter in Elmwood Park works well together with the transmitter in Paramus, and these two transmitters cannot be differentiated on the map shown in Figure B-8. Their coverage reaches further south on the Garden State Parkway, however, due to interference, coverage on Route 17 is rather poor, especially south of NJ-4. Figure B-9

demonstrates clearly that two transmitters in Parsippany, located at NJ-23 and I-80, and at I-80 and I-280, are transmitting relatively strong signals, and have a coverage zone of about two miles in each direction, but there is a zone of about one mile in between with relatively weak reception.

Another HAR transmitter located on I-80, is in western New Jersey at Allamuchy. This transmitter has a broadcast range of about two to three miles, but does not cover any major highway intersections. The measured data for this station is plotted in Figure B-10. Two HAR transmitters exist on US-1. The first is near the intersection of US-1 and I-287, as shown in Figure B-11, and has a good range of about four miles. Its coverage zone includes sections of the Garden State Parkway, US-1, and I-287, and can be well received on all these roads. The measured data plotted in Figure B-12 corresponds to the second HAR transmitter at the US-1 and I-295 interchange, located near Trenton. This transmitter has a very good range of about five miles, and can be received well on I-295 and US-1. The final transmitter owned and operated by the New Jersey Department of Transportation is located in Carneys Point, on I-295 near Delaware. No HAR message could be received on this station, however an interfering commercial station was identified. Signal strength indicates the presence of an HAR transmission, however, no messages were encountered during testing. A map indicating the coverage zone of this transmitter can be found in Figure B-13.

Other Transmitters

The New Jersey Highway Authority which governs the Garden State Parkway, runs a HAR transmitter located near Exit 98, at the intersection of the Parkway and I-195. This location is also the intersection of other major roadways, including NJ-34 and NJ-18, and is near NJ-33. The coverage zone for this station extends to about a three mile radius. This transmitter's coverage zone is shown in Figure B-14 and as indicated, NJ-33 is not covered by this HAR.

A HAR transmitter operated by the Port Authority of New York and New Jersey at the Newark International Airport, Figure B-15, provides airline passengers and airport personnel with vital parking information, as well as roadway construction and traffic information. This transmitter operates at 530 kHz AM. Its range is about three miles, but covers many important roadways such as the Turnpike, US-1, US-22, and I-78.

Another HAR system has a transmitter located at the Pleasantville toll plaza on the Atlantic City Expressway which is operated by the South Jersey Transportation Authority in conjunction with the Atlantic City Convention and Visitor's Authority. It is essentially a Traveler's Information System (TIS) for Atlantic City, broadcasting traffic information as needed. The range of the signal is about four miles, higher in the direction of Atlantic City, most likely due to wetlands in that area. This map is shown in Figure B-16.

There is an HAR transmitter which is located in Union Beach, on NJ-36. This is essentially a TIS station for Sandy Hook National Recreation Area and is licensed to the borough of Union Beach. The measured data is mapped in Figure B-2. Note its proximity to the transmitter at Exit 11 of the New Jersey Turnpike at the Garden State Parkway.

Another transmitter of interest is located in Wilmington, Delaware, which has a significant coverage area within New Jersey on I-295 and US130. The coverage zone of this station nearly reaches the Walt Whitman Bridge where interference from a commercial broadcasting station begins to suppress the HAR signal. This transmitter is shown in Figure B-17. Two transmitters located in New Jersey, but not studied are Rutgers University's TIS, which is dedicated to broadcasting university related information and local campus traffic conditions, and a new, but non-functioning transmitter in Monmouth Beach.

Recommendations for Future HAR Implementations in New Jersey

Traditionally, intersections of major highways experience higher volumes of traffic and are ideal locations for HAR installations. As can be observed in Figure 10, Page 23, most of the populated regions in New Jersey with major highway intersections are adequately covered with existing HAR systems. However, the new HAR locations shown in Figure 11 (yellow circles with a radius of three miles) would significantly improve HAR coverage in New Jersey for heavily traveled roadways.

When observing Figure 10, several areas that lack adequate HAR coverage may be noted. The intersections of I-78 with I-287 and with NJ-24 could become ideal locations to serve a large number of motorists. These highways are heavily traveled, and often congested. Additionally, coverage at these sites would provide the information necessary for motorists to take advantage of alternate routes in the region. See Figure 11, Page 30 for the suggested new HAR site.

Also, coverage does not reach the intersection of I-195 with the New Jersey Turnpike. Although there is adequate coverage of the Turnpike at exits north and south of Exit 7A, their signals do not extend to motorists that need to make decisions on I-195. See Figure 10. Two possible solutions to this problem exist. Either the transmitter at Exit 7 on the Turnpike could be moved about two to three miles north to encompass this region, or another transmitter could be installed to cover I-195. See Figure 11.

A third recommendation would be to expand coverage of the region between the Walt Whitman, and Ben Franklin Bridges. One transmitter located between the bridges, as shown in Figure 11, could possibly encompass both bridges. Currently there is no coverage at either of these bridges leading to Philadelphia, although the map shows that there is coverage nearby on the New Jersey Turnpike, the transmitter is located about six miles away. If both bridges cannot be covered by one transmitter, it would be recommended to place a transmitter at each bridge.

Another recommendation for a new transmitter is at the Garden State Parkway and NJ-18 intersection. A new station at that location could also encompass NJ-33, which is not included in the coverage zone of a southern transmitter at Exit 98. See Figure 11.

Northern I-287 at the intersection of routes US-202 and NJ-23 has also been identified as a prime candidate for HAR coverage. One transmitter may be sufficient to cover both intersections. Another area in northern New Jersey that could benefit from HAR is the Palisades Interstate Parkway, near the George Washington Bridge. This heavily traveled corridor currently has no coverage, yet alternate routes to the George Washington Bridge offer various options for motorists.

The Garden State Parkway near Exit 140 intersecting US-22 is another frequently congested area that could benefit from HAR coverage. The nearest transmitter is at the Newark International Airport, broadcasting on 530 kHz AM. See Figure 11.

Finally, two southern areas of New Jersey that have been identified for new systems are on the Atlantic City Expressway intersecting with US-206 (actually NJ-54), and the Garden State Parkway and US-9 at NJ-72. See Figure 11. The Atlantic City Expressway at US-206 (actually NJ-54) is a major highway intersection, and US-322 is a viable alternate route for southbound travelers. NJ-72 sees significant summer beach traffic, and there are many alternate routes, including the Garden State Parkway.

The most logical and cost-effective solution for new transmitters would be to use basic transmitters. Such basic transmitters should be equipped with cellular phones for convenience, and if necessary, solar power. Additional options that should be considered are battery backup systems and also synchronized systems, particularly along the I-78 corridor and the Garden State Parkway.

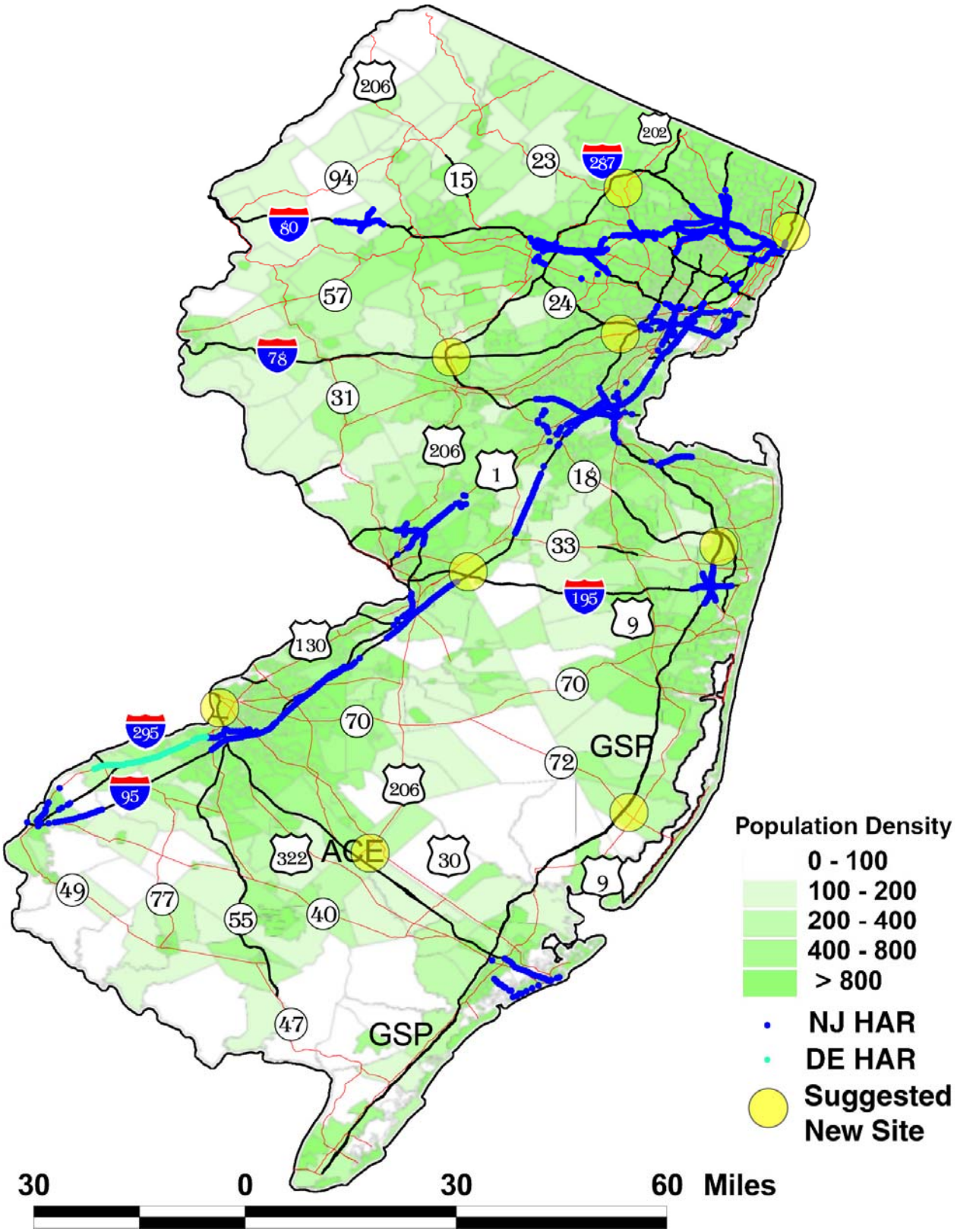

Figure 11. Current and Suggested HAR System Sites

Other HAR Related Recommendations

Additional improvements, concerning the existing HAR systems, are recommended based on the findings of this project. These improvements can significantly improve the service of existing transmitters. Recommendations for operational HAR transmitters in New Jersey are detailed below.

The transmitters at interchange 16W of the New Jersey Turnpike and Carneys Point on I-295 have reduced coverage areas due to interference from local commercial stations. It is recommended to either move the location or change the operating frequencies of these stations in order to improve their coverage areas. It is also suggested that potential sites for new transmitters be properly surveyed for potential interference before installation.

The transmitters at I-80 in Allamuchy and at I-280 in Roseland have standard reflective signs. However, these signs do not have flashing lights to alert motorists of emergency information. Signs with flashing lights are operational at all other HAR locations and are vital in notifying motorists of any emergency information. Therefore, it is recommended that new signing with these flashing lights be installed in the coverage zones of these two transmitters. Also, many major and auxiliary roadways within the coverage areas of existing HAR systems, lack signs to alert motorists to the presence of these systems. By installing additional signs along these roadways, the efficiency of these HAR systems could be greatly improved.

To provide traffic information to the public, the agencies that operate these HAR systems and the agencies who are responsible for the major and auxiliary roadways must work together. In northern New Jersey, this is accomplished through the work of TRANSCOM, a coalition of 17 transportation and public safety agencies in New Jersey, New York, and Connecticut. It is recommended that such coordination efforts be extended throughout the State.

Variable Message Signs (VMS) are also used within the State of New Jersey to relay traveler information and traffic data to motorists. It is recommended that the locations of these signs and the coordination of information on these signs and HAR systems be investigated to ensure that a consistent message is being relayed to the public. These signs are also particularly useful when used in conjunction with mobile HAR transmitters to alert the public of their presence.

Low powered HAR stations and the purchase of commercial radio stations were investigated and mentioned earlier in the report. The advantages and disadvantages of implementing these systems were discussed. Circumstances in the future may make these systems more advantageous to implement. Therefore operating agencies within the State may want to re-consider using such systems in the future.

Conclusions

The current state of Highway Advisory Radio systems in New Jersey was studied. All the existing HAR systems were identified and their coverage areas were quantified experimentally. Geographical maps for this information were generated which depict the coverage of each HAR location and the statewide HAR coverage. Current implementation of HAR in other states as well as state-of-the-art HAR hardware options including costs were investigated. Suggestions have been drawn recommending future implementations of HAR in New Jersey. Based on the experimental results, it has been determined that reasonable coverage exists for the State, however a few new HAR implementations and changes to existing systems could help to reduce congestion and improve safety on New Jersey's highways.

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APPENDIX A

TEST DATA

The following appendix contains raw data collected by the recording equipment in the test vehicle using the test software, as well as start and stop times for the respective tests. The data is mapped in Appendix B. The format for the data is as follows:

Entry,Latitude,Longitude,Level

Where Entry is the number of the data point, and Level is the Signal to Noise Ratio (SNR) of the surveyed HAR station. The data is organized into files, corresponding to the date and test run of that day. For example, 07031.TXT is the data file for the first run on July 3rd.

07031.TXT Data

Logging started on: 07/03/01at 3:46:37 PM
Center Frequency: 1.610000E+3
Logging stopped on: 07/03/01at 4:32:46 PM
Logging started on: 07/03/01at 6:19:11 PM
Center Frequency: 1.610000E+3
Logging stopped on: 07/03/01at 8:05:06 PM

Entry,Latitude,Longitude,Level

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154,40.0577,-74.7790,8.400000
155,40.0545,-74.7848,7.250000
156,40.0512,-74.7908,4.150000
157,40.0481,-74.7965,4.250000
158,40.0445,-74.8022,4.000000
159,40.0406,-74.8074,5.100000
160,40.0364,-74.8118,5.400000
161,40.0319,-74.8163,6.200000
162,40.0277,-74.8206,4.350000
163,40.0233,-74.8251,10.650000
164,40.0188,-74.8296,9.200000
165,40.0144,-74.8341,12.050000
166,40.0102,-74.8385,11.450000
167,40.0064,-74.8440,13.600000
168,40.0034,-74.8502,13.250000
169,40.0009,-74.8564,18.200000
170,39.9979,-74.8626,16.150000
171,39.9942,-74.8681,21.400000
172,39.9906,-74.8733,19.900000
173,39.9871,-74.8790,24.050000
174,39.9839,-74.8851,30.050000
175,39.9810,-74.8909,37.400000
176,39.9774,-74.8966,42.450000
177,39.9733,-74.9015,39.950000
178,39.9689,-74.9061,37.600000
179,39.9648,-74.9106,27.800000
180,39.9606,-74.9156,30.400000
181,39.9566,-74.9206,29.300000
182,39.9527,-74.9255,25.750000
183,39.9487,-74.9306,22.400000
184,39.9448,-74.9359,20.800000
185,39.9411,-74.9410,19.800000
186,39.9371,-74.9461,19.550000
187,39.9330,-74.9511,18.150000
188,39.9290,-74.9558,11.300000
189,39.9249,-74.9608,14.350000
190,39.9208,-74.9658,15.200000
191,39.9168,-74.9706,14.700000
192,39.9124,-74.9751,13.700000
226,39.8343,-75.1293,13.850000
227,39.8304,-75.1345,9.600000
228,39.8269,-75.1404,7.650000
229,39.8240,-75.1465,2.250000
230,39.8210,-75.1528,3.200000
231,39.8180,-75.1592,2.750000
232,39.8151,-75.1653,2.450000
233,39.8121,-75.1717,3.850000
234,39.8090,-75.1781,3.700000
235,39.8061,-75.1842,4.100000
236,39.8030,-75.1906,3.300000
237,39.7997,-75.1966,2.950000
238,39.7964,-75.2023,3.250000
239,39.7933,-75.2079,3.500000
240,39.7901,-75.2136,4.300000
241,39.7868,-75.2196,4.600000
242,39.7834,-75.2255,4.750000
243,39.7801,-75.2313,4.900000
244,39.7768,-75.2372,4.600000
245,39.7734,-75.2431,4.600000
246,39.7702,-75.2489,4.300000
247,39.7668,-75.2548,4.250000
248,39.7633,-75.2605,3.950000
249,39.7599,-75.2661,4.500000
250,39.7564,-75.2719,5.050000
251,39.7528,-75.2777,4.300000
252,39.7495,-75.2833,4.250000
253,39.7460,-75.2892,4.250000
254,39.7425,-75.2949,4.550000
255,39.7391,-75.3005,4.350000
256,39.7356,-75.3063,4.650000
257,39.7321,-75.3121,5.000000
258,39.7287,-75.3176,5.150000
259,39.7252,-75.3235,5.150000
260,39.7223,-75.3299,4.750000
261,39.7195,-75.3359,4.350000
262,39.7166,-75.3423,7.850000
263,39.7137,-75.3487,9.900000
264,39.7110,-75.3549,11.850000
265,39.7086,-75.3615,11.900000
266,39.7062,-75.3682,19.400000
267,39.7039,-75.3746,21.500000
268,39.7016,-75.3814,24.450000
269,39.6994,-75.3882,30.850000
270,39.6973,-75.3951,39.500000
271,39.6953,-75.4016,46.450000
272,39.6932,-75.4085,34.700000
273,39.6911,-75.4154,30.650000
274,39.6898,-75.4223,24.100000
275,39.6887,-75.4295,13.350000
276,39.6875,-75.4367,17.950000
277,39.6867,-75.4437,15.600000
278,39.6856,-75.4508,14.450000
279,39.6838,-75.4578,6.350000
280,39.6825,-75.4643,10.100000
281,39.6816,-75.4692,8.150000
282,39.6809,-75.4726,6.050000
283,39.6798,-75.4782,6.250000
284,39.6791,-75.4849,6.600000
285,39.6798,-75.4911,7.150000
286,39.6817,-75.4963,4.350000
287,39.6838,-75.5023,8.500000
288,39.6857,-75.5080,14.000000

07281.TXT Data

Logging started on: 07/28/01at 8:14:15 PM
Center Frequency: 1.610000E+3
Logging stopped on: 07/28/01at 8:29:15 PM
Logging started on: 07/28/01at 8:33:35 PM
Center Frequency: 1.610000E+3
Logging stopped on: 07/28/01at 9:52:30 PM

Entry,Latitude,Longitude,Level
1,40.1018,-74.1388,3.950000
2,40.1054,-74.1363,5.200000
3,40.1105,-74.1336,5.450000
4,40.1153,-74.1301,7.300000
5,40.1206,-74.1272,7.950000
6,40.1262,-74.1256,8.300000
7,40.1309,-74.1220,9.050000
8,40.1349,-74.1164,12.850000
9,40.1395,-74.1120,16.100000
10,40.1446,-74.1094,19.200000
11,40.1497,-74.1061,21.950000
12,40.1551,-74.1036,25.300000
13,40.1605,-74.1022,33.100000
14,40.1662,-74.1008,38.050000
15,40.1718,-74.0992,44.650000
16,40.1774,-74.0993,49.000000
17,40.1831,-74.0998,38.000000
18,40.1888,-74.0998,30.750000
19,40.1943,-74.0991,26.500000
20,40.2001,-74.0980,23.350000
21,40.2058,-74.0973,18.600000
22,40.2113,-74.0973,16.100000
23,40.2171,-74.0976,13.350000
24,40.2228,-74.0970,11.550000
25,40.2281,-74.0951,10.150000
26,40.2334,-74.0919,6.550000
27,40.2380,-74.0882,5.250000
28,40.2431,-74.0845,4.600000
29,40.2482,-74.0820,5.750000
30,40.2508,-74.0815,4.450000
31,40.2542,-74.0802,4.350000
32,40.2596,-74.0793,3.500000
33,40.2652,-74.0779,2.350000
34,40.2707,-74.0781,4.300000
35,40.2763,-74.0804,4.050000
36,40.2813,-74.0835,5.200000
37,40.2847,-74.0826,4.050000
38,40.2863,-74.0793,6.600000
39,40.2500,-74.0556,3.700000
40,40.2444,-74.0541,3.250000
41,40.2396,-74.0528,3.400000
42,40.2352,-74.0513,4.250000
43,40.2301,-74.0502,4.450000
44,40.2255,-74.0510,3.900000
45,40.2210,-74.0523,4.650000
46,40.2163,-74.0516,7.550000
47,40.2115,-74.0521,8.800000
48,40.2083,-74.0539,11.050000
49,40.2068,-74.0550,9.500000
50,40.2076,-74.0592,8.650000
51,40.2080,-74.0638,10.900000
52,40.2085,-74.0689,9.400000
53,40.2089,-74.0740,8.450000
54,40.2093,-74.0777,10.300000
55,40.2093,-74.0783,11.100000
56,40.2093,-74.0808,11.600000
57,40.2093,-74.0845,12.200000
58,40.2096,-74.0860,15.000000
59,40.2103,-74.0902,12.000000
60,40.2109,-74.0919,9.350000
61,40.2130,-74.0963,11.700000
62,40.2162,-74.1008,14.500000
81,40.2190,-74.1224,6.850000
82,40.2186,-74.1169,6.750000
83,40.2181,-74.1110,2.850000
84,40.2176,-74.1060,5.900000
85,40.2160,-74.1017,7.250000
86,40.2126,-74.1002,10.600000
87,40.2088,-74.0986,12.500000
88,40.2034,-74.0988,13.500000
89,40.1983,-74.0999,19.600000
90,40.1930,-74.1008,23.100000
91,40.1876,-74.1012,24.400000
92,40.1825,-74.1014,28.550000
93,40.1776,-74.1011,32.950000
94,40.1742,-74.1011,36.150000
95,40.1705,-74.1012,59.000000
96,40.1664,-74.1025,42.650000
97,40.1680,-74.1052,36.400000
98,40.1720,-74.1073,44.850000
99,40.1764,-74.1097,32.600000
100,40.1794,-74.1113,27.300000
101,40.1840,-74.1137,22.150000
102,40.1883,-74.1156,22.350000
103,40.1929,-74.1175,21.750000
104,40.1976,-74.1195,18.950000
105,40.2005,-74.1207,14.250000
106,40.2048,-74.1225,12.300000
107,40.2095,-74.1245,11.800000
108,40.2143,-74.1265,9.350000
109,40.2183,-74.1282,10.150000
110,40.2191,-74.1289,10.250000
111,40.2152,-74.1271,3.400000
112,40.2129,-74.1262,9.500000
113,40.2120,-74.1258,11.050000
114,40.2077,-74.1240,5.800000
115,40.2029,-74.1220,4.800000
116,40.1987,-74.1202,9.550000
117,40.1944,-74.1184,10.350000
118,40.1899,-74.1165,16.350000
119,40.1855,-74.1146,18.500000
120,40.1811,-74.1125,21.400000
121,40.1769,-74.1102,28.350000
122,40.1728,-74.1081,35.400000
123,40.1701,-74.1089,40.000000
124,40.1699,-74.1148,34.900000
125,40.1704,-74.1219,28.300000
126,40.1700,-74.1287,25.850000
127,40.1677,-74.1348,20.250000
128,40.1648,-74.1406,16.900000
129,40.1634,-74.1474,13.600000
130,40.1637,-74.1542,13.950000
131,40.1643,-74.1614,12.200000
132,40.1650,-74.1680,8.450000
133,40.1658,-74.1748,7.300000
134,40.1666,-74.1819,6.550000
135,40.1673,-74.1886,5.000000
136,40.1673,-74.1948,4.250000
137,40.1672,-74.2012,3.100000
138,40.1671,-74.2077,3.400000
139,40.1670,-74.2138,2.050000
140,40.1669,-74.2204,2.450000
141,40.1668,-74.2274,2.900000
142,40.1657,-74.2336,2.800000
161,40.1689,-74.1316,18.750000
162,40.1702,-74.1254,19.850000
163,40.1699,-74.1188,27.850000
164,40.1697,-74.1121,31.050000
165,40.1699,-74.1051,38.350000
166,40.1701,-74.0991,50.500000
167,40.1703,-74.0930,41.800000
168,40.1706,-74.0867,32.950000
169,40.1708,-74.0807,21.000000
170,40.1710,-74.0745,17.650000
171,40.1711,-74.0702,18.900000
172,40.1714,-74.0646,16.750000
173,40.1718,-74.0586,13.650000
174,40.1727,-74.0523,12.450000
175,40.1735,-74.0465,13.000000
176,40.1749,-74.0422,12.000000
177,40.1777,-74.0401,11.400000
178,40.1785,-74.0364,6.900000
179,40.1779,-74.0343,7.200000
180,40.1781,-74.0343,5.950000
181,40.1786,-74.0375,11.950000
182,40.1769,-74.0412,12.150000
183,40.1768,-74.0413,12.350000
184,40.1745,-74.0433,10.900000
185,40.1734,-74.0486,12.700000
186,40.1725,-74.0546,15.700000
187,40.1718,-74.0609,18.300000
188,40.1715,-74.0671,19.800000
189,40.1712,-74.0743,20.950000
190,40.1710,-74.0808,20.000000
191,40.1709,-74.0826,12.950000
192,40.1707,-74.0887,19.200000
193,40.1705,-74.0946,32.250000
194,40.1703,-74.1006,41.700000
195,40.1701,-74.1066,47.450000
196,40.1709,-74.1072,38.400000
197,40.1671,-74.1050,43.650000
198,40.1625,-74.1025,37.900000
199,40.1582,-74.1002,32.450000
200,40.1548,-74.0985,25.900000
201,40.1529,-74.0975,23.550000
202,40.1507,-74.0964,18.650000
203,40.1485,-74.0954,21.550000
204,40.1451,-74.0940,15.450000
205,40.1410,-74.0923,9.800000
206,40.1367,-74.0905,10.200000
207,40.1322,-74.0884,7.550000
208,40.1283,-74.0852,9.250000
209,40.1273,-74.0847,9.900000
210,40.1275,-74.0843,10.000000
211,40.1304,-74.0866,3.400000
212,40.1340,-74.0892,12.100000
213,40.1382,-74.0910,10.350000
214,40.1427,-74.0928,16.500000
215,40.1470,-74.0946,17.750000
216,40.1504,-74.0957,21.800000
217,40.1531,-74.0974,12.250000
218,40.1552,-74.0985,12.450000
219,40.1570,-74.0995,17.150000
220,40.1597,-74.1008,24.950000
221,40.1637,-74.1029,32.350000
222,40.1678,-74.1051,33.600000

63,40.2176,-74.1047,9.900000
64,40.2181,-74.1100,8.000000
65,40.2185,-74.1159,10.150000
66,40.2191,-74.1220,7.050000
67,40.2192,-74.1235,5.550000
68,40.2192,-74.1236,4.950000
69,40.2193,-74.1268,3.100000
70,40.2203,-74.1301,10.950000
71,40.2223,-74.1342,6.700000
72,40.2246,-74.1390,4.700000
73,40.2267,-74.1434,5.950000
74,40.2267,-74.1461,3.600000
75,40.2261,-74.1425,5.900000
76,40.2238,-74.1378,6.350000
77,40.2214,-74.1327,4.350000
78,40.2189,-74.1287,13.050000
79,40.2188,-74.1282,11.700000
80,40.2192,-74.1261,10.900000
143,40.1648,-74.2377,3.000000
144,40.1642,-74.2353,2.600000
145,40.1643,-74.2359,2.950000
146,40.1663,-74.2304,4.150000
147,40.1666,-74.2235,2.500000
148,40.1667,-74.2169,2.900000
149,40.1668,-74.2104,2.500000
150,40.1669,-74.2038,2.150000
151,40.1670,-74.1975,4.150000
152,40.1671,-74.1911,5.150000
153,40.1667,-74.1843,4.350000
154,40.1659,-74.1778,4.450000
155,40.1651,-74.1707,7.800000
156,40.1642,-74.1637,8.200000
157,40.1636,-74.1568,11.400000
158,40.1632,-74.1499,11.650000
159,40.1637,-74.1433,12.750000
160,40.1660,-74.1373,15.850000
223,40.1711,-74.1060,43.600000
224,40.1701,-74.1072,47.800000
225,40.1703,-74.1067,38.200000
226,40.1662,-74.1045,41.450000
227,40.1620,-74.1036,37.950000
228,40.1569,-74.1044,32.650000
229,40.1515,-74.1063,27.150000
230,40.1467,-74.1093,21.800000
231,40.1416,-74.1124,19.800000
232,40.1368,-74.1156,16.450000
233,40.1326,-74.1208,13.350000
234,40.1281,-74.1253,10.450000
235,40.1229,-74.1275,7.700000
236,40.1176,-74.1298,5.450000
237,40.1126,-74.1334,4.300000
238,40.1077,-74.1362,4.350000

07301.TXT Data

Logging started on: 07/31/01at 12:11:04 AM
Center Frequency: 5.300000E+2
Logging stopped on: 07/31/01at 1:41:46 AM

Entry,Latitude,Longitude,Level
1,40.7641,-74.2171,5.500000
2,40.7641,-74.2171,5.150000
3,40.7641,-74.2171,5.700000
4,40.7656,-74.2201,4.050000
5,40.7676,-74.2263,14.350000
6,40.7704,-74.2318,15.300000
7,40.7714,-74.2377,10.350000
8,40.7758,-74.2414,10.000000
9,40.7809,-74.2427,12.650000
10,40.7845,-74.2469,11.650000
11,40.7890,-74.2489,9.800000
12,40.7940,-74.2487,11.600000
13,40.7977,-74.2523,10.950000
14,40.7976,-74.2591,15.900000
15,40.7980,-74.2661,12.950000
16,40.7992,-74.2722,14.150000
17,40.8015,-74.2783,8.150000
18,40.8050,-74.2843,14.050000
19,40.8087,-74.2892,14.750000
20,40.8105,-74.2958,10.650000
21,40.8110,-74.3029,17.750000
22,40.8131,-74.3089,14.900000
23,40.8166,-74.3135,19.650000
24,40.8214,-74.3171,19.450000
25,40.8256,-74.3213,19.400000
26,40.8278,-74.3249,0.000000
27,40.8318,-74.3314,19.500000
28,40.8362,-74.3359,21.900000
29,40.8407,-74.3395,22.600000
30,40.8439,-74.3451,25.100000
31,40.8468,-74.3510,25.600000
32,40.8510,-74.3546,25.300000
33,40.8553,-74.3585,31.300000
34,40.8584,-74.3638,36.150000
35,40.8595,-74.3693,37.500000
36,40.8592,-74.3757,49.850000
37,40.8603,-74.3824,34.250000
38,40.8608,-74.3887,28.100000
39,40.8605,-74.3955,26.350000
40,40.8615,-74.4023,25.250000
41,40.8629,-74.4086,22.900000
42,40.8640,-74.4151,22.750000
43,40.8650,-74.4220,18.900000
44,40.8657,-74.4288,24.550000
45,40.8662,-74.4359,30.650000
46,40.8670,-74.4429,38.500000
78,40.8630,-74.4445,37.850000
79,40.8615,-74.4479,30.800000
80,40.8599,-74.4507,14.500000
81,40.8572,-74.4527,16.350000
82,40.8540,-74.4542,6.350000
83,40.8508,-74.4559,16.450000
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87,40.8441,-74.4637,11.200000
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89,40.8417,-74.4654,18.800000
90,40.8394,-74.4684,13.650000
91,40.8373,-74.4709,13.050000
92,40.8372,-74.4710,5.950000
93,40.8380,-74.4703,10.450000
94,40.8407,-74.4666,9.250000
95,40.8418,-74.4651,13.950000
96,40.8418,-74.4651,7.800000
97,40.8433,-74.4642,10.600000
98,40.8435,-74.4636,15.100000
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101,40.8372,-74.4487,18.050000
102,40.8351,-74.4438,18.600000
103,40.8328,-74.4388,14.250000
104,40.8304,-74.4347,16.400000
105,40.8284,-74.4301,13.100000
106,40.8265,-74.4249,15.300000
107,40.8253,-74.4197,13.600000
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110,40.8206,-74.4076,11.800000
111,40.8191,-74.4055,8.450000
112,40.8169,-74.4022,10.800000
113,40.8153,-74.3996,12.600000
114,40.8131,-74.3951,12.750000
115,40.8126,-74.3929,4.300000
116,40.8120,-74.3888,15.300000
117,40.8104,-74.3835,16.300000
118,40.8095,-74.3812,17.250000
119,40.8095,-74.3812,15.200000
120,40.8084,-74.3781,13.400000
121,40.8071,-74.3733,11.000000
122,40.8053,-74.3685,22.050000
123,40.8035,-74.3645,14.700000
155,40.8583,-74.3440,24.750000
156,40.8585,-74.3413,16.700000
157,40.8587,-74.3373,18.600000
158,40.8589,-74.3326,16.250000
159,40.8592,-74.3273,19.950000
160,40.8608,-74.3231,15.600000
161,40.8636,-74.3195,16.600000
162,40.8660,-74.3155,19.450000
163,40.8673,-74.3125,16.250000
164,40.8679,-74.3124,14.850000
165,40.8657,-74.3164,17.400000
166,40.8629,-74.3208,20.350000
167,40.8599,-74.3249,20.950000
168,40.8591,-74.3306,21.000000
169,40.8589,-74.3363,18.500000
170,40.8587,-74.3402,23.300000
171,40.8587,-74.3403,22.500000
172,40.8584,-74.3443,18.900000
173,40.8582,-74.3485,25.050000
174,40.8582,-74.3528,25.100000
175,40.8592,-74.3591,27.250000
176,40.8607,-74.3654,30.100000
177,40.8619,-74.3713,45.900000
178,40.8621,-74.3750,34.900000
179,40.8626,-74.3803,28.450000
180,40.8629,-74.3841,28.050000
181,40.8629,-74.3841,26.300000
182,40.8630,-74.3852,26.550000
183,40.8634,-74.3897,23.000000
184,40.8638,-74.3949,20.150000
185,40.8642,-74.3999,22.950000
186,40.8649,-74.4043,15.500000
187,40.8663,-74.4096,20.700000
188,40.8679,-74.4128,13.500000
189,40.8695,-74.4163,15.950000
190,40.8709,-74.4205,10.200000
191,40.8712,-74.4221,20.650000
192,40.8723,-74.4272,24.650000
193,40.8730,-74.4299,24.800000
194,40.8739,-74.4329,25.700000
195,40.8754,-74.4375,27.150000
196,40.8770,-74.4422,23.100000
197,40.8785,-74.4465,25.000000
198,40.8789,-74.4477,14.100000
199,40.8801,-74.4502,19.700000
200,40.8821,-74.4540,17.400000

47,40.8681,-74.4497,37.850000
48,40.8685,-74.4567,28.850000
49,40.8716,-74.4625,23.100000
50,40.8758,-74.4666,17.550000
51,40.8809,-74.4690,16.050000
52,40.8854,-74.4707,17.650000
53,40.8886,-74.4741,18.250000
54,40.8905,-74.4792,16.800000
55,40.8923,-74.4838,14.850000
56,40.8959,-74.4871,14.200000
57,40.9001,-74.4901,15.500000
58,40.9038,-74.4942,11.900000
59,40.9068,-74.4988,11.200000
60,40.9096,-74.5038,11.200000
61,40.9103,-74.5030,8.900000
62,40.9093,-74.5037,8.800000
63,40.9092,-74.5056,7.550000
64,40.9079,-74.5011,12.050000
65,40.9045,-74.4957,10.000000
66,40.9003,-74.4907,11.300000
67,40.8956,-74.4873,12.250000
68,40.8917,-74.4833,9.500000
69,40.8895,-74.4769,11.700000
70,40.8864,-74.4718,12.600000
71,40.8817,-74.4698,18.500000
72,40.8767,-74.4676,17.400000
73,40.8721,-74.4635,19.550000
74,40.8687,-74.4582,20.300000
75,40.8674,-74.4513,25.500000
76,40.8668,-74.4446,30.450000
77,40.8646,-74.4414,58.900000
124,40.8034,-74.3643,14.950000
125,40.8025,-74.3625,12.150000
126,40.8001,-74.3582,15.250000
127,40.7980,-74.3540,5.300000
128,40.7969,-74.3498,10.650000
129,40.7966,-74.3461,8.050000
130,40.7960,-74.3420,8.700000
131,40.7960,-74.3415,13.650000
132,40.7974,-74.3413,13.350000
133,40.7994,-74.3412,10.350000
134,40.8030,-74.3410,15.600000
135,40.8070,-74.3393,16.400000
136,40.8106,-74.3371,13.100000
137,40.8142,-74.3349,19.100000
138,40.8168,-74.3316,13.900000
139,40.8191,-74.3289,14.200000
140,40.8214,-74.3263,14.100000
141,40.8239,-74.3231,10.450000
142,40.8259,-74.3197,19.800000
143,40.8257,-74.3213,19.650000
144,40.8289,-74.3267,22.950000
145,40.8321,-74.3318,18.700000
146,40.8357,-74.3356,21.700000
147,40.8397,-74.3387,21.400000
148,40.8429,-74.3428,24.550000
149,40.8449,-74.3477,25.650000
150,40.8477,-74.3511,25.450000
151,40.8497,-74.3503,25.200000
152,40.8528,-74.3480,19.750000
153,40.8563,-74.3488,22.600000
154,40.8581,-74.3487,22.750000
201,40.8841,-74.4590,20.250000
202,40.8861,-74.4635,13.400000
203,40.8887,-74.4676,9.200000
204,40.8897,-74.4712,13.150000
205,40.8885,-74.4673,11.750000
206,40.8860,-74.4636,15.600000
207,40.8853,-74.4627,17.100000
208,40.8837,-74.4579,18.150000
209,40.8817,-74.4533,18.000000
210,40.8793,-74.4488,16.600000
211,40.8774,-74.4439,22.800000
212,40.8756,-74.4386,26.450000
213,40.8744,-74.4348,23.000000
214,40.8731,-74.4307,23.350000
215,40.8719,-74.4262,22.250000
216,40.8710,-74.4222,17.850000
217,40.8710,-74.4220,17.750000
218,40.8707,-74.4207,17.350000
219,40.8703,-74.4211,17.150000
220,40.8706,-74.4213,23.450000
221,40.8713,-74.4217,22.300000
222,40.8744,-74.4231,24.700000
223,40.8774,-74.4213,22.800000
224,40.8809,-74.4207,16.450000
225,40.8841,-74.4190,13.300000
226,40.8873,-74.4175,9.350000
227,40.8905,-74.4157,13.500000
228,40.8926,-74.4158,11.100000
229,40.8921,-74.4128,17.800000
230,40.8918,-74.4110,15.050000

07302.TXT Data

Logging started on: 07/31/01at 2:49:05 AM
Center Frequency: 5.300000E+2
Logging stopped on: 07/31/01at 3:26:56 AM

Entry,Latitude,Longitude,Level
1,40.9182,-74.8134,38.700000
2,40.9170,-74.8149,43.800000
3,40.9136,-74.8171,28.500000
4,40.9104,-74.8200,17.250000
5,40.9071,-74.8217,21.500000
6,40.9036,-74.8231,5.850000
7,40.9003,-74.8246,2.400000
8,40.8973,-74.8260,11.150000
9,40.8991,-74.8251,10.000000
10,40.9034,-74.8231,17.850000
11,40.9074,-74.8215,9.550000
12,40.9113,-74.8194,19.950000
13,40.9147,-74.8163,15.800000
14,40.9179,-74.8137,31.750000
15,40.9208,-74.8094,38.800000
16,40.9245,-74.8086,22.750000
17,40.9282,-74.8085,9.100000
18,40.9324,-74.8076,14.350000
19,40.9365,-74.8063,18.550000
20,40.9396,-74.8031,21.500000
21,40.9430,-74.8000,23.100000
22,40.9463,-74.7970,14.500000
23,40.9494,-74.7941,10.100000
24,40.9522,-74.7909,2.000000
25,40.9529,-74.7898,5.050000
26,40.9504,-74.7930,10.450000
27,40.9471,-74.7964,7.300000
28,40.9437,-74.7995,6.300000
29,40.9402,-74.8026,4.750000
30,40.9368,-74.8062,15.200000
31,40.9328,-74.8075,22.700000
32,40.9293,-74.8083,21.550000
33,40.9259,-74.8088,17.200000
34,40.9221,-74.8086,9.300000
35,40.9192,-74.8114,27.850000
36,40.9181,-74.8154,43.350000
37,40.9183,-74.8212,34.300000
38,40.9183,-74.8277,27.100000
39,40.9204,-74.8340,23.050000
40,40.9196,-74.8403,18.400000
41,40.9202,-74.8467,19.100000
42,40.9217,-74.8533,17.350000
43,40.9223,-74.8598,13.500000
44,40.9228,-74.8665,15.100000
45,40.9233,-74.8732,13.800000
46,40.9252,-74.8789,11.500000
47,40.9280,-74.8845,10.100000
48,40.9293,-74.8904,10.000000
49,40.9297,-74.8959,2.200000
50,40.9307,-74.9018,6.350000
51,40.9297,-74.9084,6.350000
52,40.9280,-74.9146,3.100000
53,40.9265,-74.9212,2.350000
54,40.9252,-74.9279,2.300000
55,40.9251,-74.9348,3.100000
56,40.9252,-74.9417,1.750000
57,40.9251,-74.9476,1.750000
58,40.9243,-74.9527,1.650000
59,40.9248,-74.9578,1.650000
60,40.9253,-74.9595,2.500000
61,40.9232,-74.9608,1.050000
62,40.9238,-74.9576,2.450000
63,40.9242,-74.9507,1.300000
64,40.9248,-74.9437,2.200000
65,40.9248,-74.9366,2.050000
66,40.9244,-74.9298,2.350000
67,40.9257,-74.9230,2.300000
68,40.9272,-74.9163,4.600000
69,40.9286,-74.9099,3.450000
70,40.9300,-74.9038,3.800000
71,40.9297,-74.8975,4.250000
72,40.9290,-74.8907,8.150000
73,40.9276,-74.8843,10.450000
74,40.9247,-74.8787,10.200000
75,40.9229,-74.8724,11.400000
76,40.9224,-74.8661,13.100000
77,40.9219,-74.8594,13.500000
78,40.9213,-74.8529,10.550000
79,40.9200,-74.8471,16.250000
80,40.9190,-74.8412,16.100000
81,40.9199,-74.8350,17.000000
82,40.9185,-74.8293,20.000000
83,40.9174,-74.8234,21.600000
84,40.9178,-74.8173,27.450000
85,40.9167,-74.8116,36.700000
86,40.9182,-74.8058,39.350000
87,40.9217,-74.8017,29.000000
88,40.9231,-74.7964,23.050000
89,40.9243,-74.7907,15.900000
90,40.9237,-74.7846,14.950000
91,40.9196,-74.7809,13.050000
92,40.9165,-74.7761,14.900000
93,40.9160,-74.7696,8.700000
94,40.9150,-74.7635,9.900000
95,40.9125,-74.7585,10.700000
96,40.9118,-74.7529,8.000000

07311.TXT Data

Logging started on: 07/31/01at 10:17:43 PM
Center Frequency: 5.300000E+2
Logging stopped on: 07/31/01at 11:44:55 PM
Logging started on: 07/31/01at 11:46:54 PM
Center Frequency: 5.300000E+2
Logging stopped on: 07/31/01at 11:47:18 PM
Logging started on: 08/01/01at 12:32:26 AM
Center Frequency: 5.300000E+2
Logging stopped on: 08/01/01at 1:08:44 AM
Logging started on: 08/01/01at 11:20:07 PM
Center Frequency: 5.300000E+2
Logging stopped on: 08/01/01at 11:47:21 PM

Entry,Latitude,Longitude,Level
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2,40.9141,-74.0484,22.300000
3,40.9139,-74.0470,23.550000
4,40.9127,-74.0425,17.700000
5,40.9103,-74.0381,20.650000
6,40.9070,-74.0344,21.450000
7,40.9038,-74.0313,19.400000
8,40.9019,-74.0295,22.100000
9,40.9006,-74.0282,18.700000
10,40.9000,-74.0274,21.150000
11,40.8990,-74.0259,17.950000
12,40.8985,-74.0249,15.600000
13,40.8979,-74.0237,9.800000
14,40.8971,-74.0220,16.150000
15,40.8967,-74.0211,6.350000
16,40.8963,-74.0203,11.100000
17,40.8960,-74.0194,11.450000
18,40.8956,-74.0183,10.850000
19,40.8947,-74.0159,12.050000
20,40.8934,-74.0122,21.150000
21,40.8919,-74.0079,11.400000
22,40.8905,-74.0033,8.450000
23,40.8891,-73.9990,9.400000
24,40.8874,-73.9947,5.750000
25,40.8874,-73.9953,9.200000
26,40.8873,-73.9940,7.150000
27,40.8888,-73.9977,9.300000
28,40.8902,-74.0022,11.350000
29,40.8918,-74.0070,15.900000
30,40.8935,-74.0122,11.050000
31,40.8951,-74.0169,20.200000
32,40.8972,-74.0219,6.150000
33,40.8999,-74.0271,13.350000
34,40.9034,-74.0307,17.950000
35,40.9070,-74.0342,15.900000
36,40.9089,-74.0360,18.750000
37,40.9109,-74.0385,24.650000
38,40.9122,-74.0409,19.750000
39,40.9129,-74.0427,20.800000
40,40.9138,-74.0458,19.250000
41,40.9150,-74.0502,22.650000
42,40.9162,-74.0548,21.050000
43,40.9174,-74.0591,21.550000
44,40.9186,-74.0635,24.400000
45,40.9197,-74.0676,26.450000
46,40.9210,-74.0728,28.400000
47,40.9224,-74.0783,32.300000
48,40.9239,-74.0835,25.650000
49,40.9257,-74.0886,23.450000
50,40.9267,-74.0934,28.450000
129,40.9201,-74.1744,20.050000
130,40.9203,-74.1739,21.250000
131,40.9204,-74.1710,17.500000
132,40.9201,-74.1701,17.350000
133,40.9190,-74.1683,20.000000
134,40.9187,-74.1655,15.150000
135,40.9186,-74.1626,12.250000
136,40.9186,-74.1599,18.750000
137,40.9185,-74.1594,15.900000
138,40.9185,-74.1587,16.800000
139,40.9184,-74.1558,19.300000
140,40.9184,-74.1552,17.400000
141,40.9183,-74.1528,18.950000
142,40.9184,-74.1527,17.550000
143,40.9183,-74.1500,20.850000
144,40.9183,-74.1464,20.650000
145,40.9183,-74.1449,24.400000
146,40.9182,-74.1429,23.750000
147,40.9182,-74.1420,16.750000
148,40.9182,-74.1420,19.600000
149,40.9181,-74.1379,19.200000
150,40.9181,-74.1320,22.750000
151,40.9187,-74.1267,27.450000
152,40.9189,-74.1261,23.300000
153,40.9194,-74.1244,24.750000
154,40.9197,-74.1230,24.950000
155,40.9199,-74.1224,20.400000
156,40.9209,-74.1185,22.900000
157,40.9222,-74.1140,17.700000
158,40.9229,-74.1112,25.450000
159,40.9229,-74.1112,23.550000
160,40.9238,-74.1074,23.800000
161,40.9250,-74.1028,19.500000
162,40.9262,-74.0980,24.150000
163,40.9263,-74.0935,25.100000
164,40.9255,-74.0882,28.300000
165,40.9236,-74.0832,22.700000
166,40.9220,-74.0775,29.950000
167,40.9207,-74.0726,31.900000
168,40.9200,-74.0721,28.500000
169,40.9235,-74.0715,33.450000
170,40.9284,-74.0705,33.150000
171,40.9330,-74.0706,48.250000
172,40.9377,-74.0711,35.400000
173,40.9426,-74.0715,31.450000
174,40.9475,-74.0720,32.600000
175,40.9521,-74.0726,25.700000
176,40.9566,-74.0740,31.700000
177,40.9610,-74.0758,21.000000
178,40.9653,-74.0775,18.800000
257,40.9560,-74.0658,17.800000
258,40.9606,-74.0656,21.000000
259,40.9656,-74.0647,23.200000
260,40.9706,-74.0658,21.650000
261,40.9745,-74.0693,15.900000
262,40.9791,-74.0706,14.450000
263,40.9822,-74.0708,15.050000
264,40.9870,-74.0721,18.600000
265,40.9920,-74.0728,16.650000
266,40.9967,-74.0715,15.600000
267,40.9988,-74.0705,16.600000
268,40.9995,-74.0726,11.900000
269,40.9990,-74.0719,12.650000
270,40.9946,-74.0730,14.500000
271,40.9897,-74.0736,17.050000
272,40.9847,-74.0720,16.150000
273,40.9802,-74.0713,16.850000
274,40.9772,-74.0709,13.300000
275,40.9728,-74.0684,18.200000
276,40.9687,-74.0657,17.500000
277,40.9637,-74.0656,22.300000
278,40.9583,-74.0662,24.400000
279,40.9532,-74.0661,22.450000
280,40.9479,-74.0667,21.700000
281,40.9428,-74.0688,25.900000
282,40.9393,-74.0716,25.050000
283,40.9349,-74.0728,28.000000
284,40.9297,-74.0725,35.600000
285,40.9252,-74.0752,40.700000
286,40.9224,-74.0810,33.150000
287,40.9195,-74.0867,29.750000
288,40.9150,-74.0891,28.900000
289,40.9108,-74.0924,23.750000
290,40.9089,-74.0970,22.100000
291,40.9078,-74.0996,19.300000
292,40.9055,-74.1052,27.650000
293,40.9026,-74.1103,25.300000
294,40.8991,-74.1145,27.000000
295,40.8951,-74.1184,30.600000
296,40.8913,-74.1228,30.250000
297,40.8899,-74.1289,27.350000
298,40.8895,-74.1355,30.300000
299,40.8886,-74.1418,28.050000
300,40.8875,-74.1482,26.600000
301,40.8862,-74.1540,25.750000
302,40.8849,-74.1601,21.900000
303,40.8821,-74.1654,23.800000
304,40.8775,-74.1664,24.300000
305,40.8726,-74.1671,17.450000
306,40.8680,-74.1693,21.600000

51,40.9283,-74.0992,25.600000
52,40.9301,-74.1055,19.750000
53,40.9320,-74.1119,14.900000
54,40.9337,-74.1179,21.450000
55,40.9360,-74.1238,20.100000
56,40.9398,-74.1270,16.200000
57,40.9436,-74.1305,19.350000
58,40.9473,-74.1341,19.900000
59,40.9509,-74.1378,18.600000
60,40.9545,-74.1410,19.000000
61,40.9586,-74.1436,13.450000
62,40.9622,-74.1466,9.550000
63,40.9654,-74.1507,7.000000
64,40.9678,-74.1535,10.150000
65,40.9685,-74.1533,2.050000
66,40.9671,-74.1556,7.900000
67,40.9685,-74.1556,12.700000
68,40.9655,-74.1510,15.550000
69,40.9616,-74.1462,4.700000
70,40.9567,-74.1423,10.800000
71,40.9518,-74.1389,18.500000
72,40.9477,-74.1348,12.350000
73,40.9437,-74.1308,17.500000
74,40.9397,-74.1271,19.000000
75,40.9355,-74.1232,19.550000
76,40.9334,-74.1174,20.650000
77,40.9315,-74.1110,22.000000
78,40.9298,-74.1048,20.300000
79,40.9280,-74.0984,21.550000
80,40.9264,-74.0939,20.450000
81,40.9257,-74.0894,21.400000
82,40.9244,-74.0852,25.700000
83,40.9229,-74.0810,27.000000
84,40.9213,-74.0772,27.950000
85,40.9228,-74.0768,30.350000
86,40.9233,-74.0775,31.400000
87,40.9226,-74.0785,30.300000
88,40.9237,-74.0827,26.300000
89,40.9257,-74.0885,23.650000
90,40.9269,-74.0947,25.900000
91,40.9260,-74.0992,21.800000
92,40.9256,-74.1007,18.950000
93,40.9246,-74.1047,20.700000
94,40.9238,-74.1079,21.050000
95,40.9237,-74.1082,21.750000
96,40.9232,-74.1103,18.550000
97,40.9223,-74.1141,25.750000
98,40.9216,-74.1165,17.100000
99,40.9209,-74.1191,18.950000
100,40.9199,-74.1230,20.150000
101,40.9192,-74.1254,21.900000
102,40.9192,-74.1254,18.900000
103,40.9185,-74.1281,11.850000
104,40.9182,-74.1326,24.450000
105,40.9182,-74.1369,23.900000
106,40.9183,-74.1414,19.350000
107,40.9183,-74.1441,18.850000
108,40.9183,-74.1463,21.850000
109,40.9184,-74.1487,23.550000
110,40.9184,-74.1512,18.650000
111,40.9184,-74.1527,18.100000
112,40.9184,-74.1536,18.800000
113,40.9184,-74.1541,20.350000
114,40.9184,-74.1548,22.000000
115,40.9185,-74.1580,17.100000
116,40.9186,-74.1588,22.300000
117,40.9186,-74.1611,16.750000
118,40.9187,-74.1617,16.950000
119,40.9187,-74.1637,16.500000
120,40.9188,-74.1651,20.400000
121,40.9188,-74.1656,21.500000
122,40.9189,-74.1676,18.000000
123,40.9190,-74.1692,13.300000
124,40.9191,-74.1725,19.100000
125,40.9191,-74.1727,13.450000
126,40.9191,-74.1727,9.650000
127,40.9191,-74.1730,10.150000
128,40.9192,-74.1753,14.000000
179,40.9700,-74.0794,17.300000
180,40.9746,-74.0813,18.350000
181,40.9789,-74.0832,17.800000
182,40.9822,-74.0871,9.550000
183,40.9858,-74.0917,8.550000
184,40.9899,-74.0949,16.500000
185,40.9948,-74.0968,16.750000
186,40.9995,-74.1002,15.050000
187,41.0045,-74.1020,12.850000
188,41.0090,-74.1050,13.400000
189,41.0133,-74.1071,13.450000
190,41.0181,-74.1079,12.600000
191,41.0232,-74.1090,13.900000
192,41.0283,-74.1102,12.700000
193,41.0332,-74.1113,14.800000
194,41.0328,-74.1093,9.450000
195,41.0327,-74.1130,13.050000
196,41.0335,-74.1116,13.050000
197,41.0282,-74.1104,13.850000
198,41.0230,-74.1092,10.000000
199,41.0177,-74.1080,14.950000
200,41.0120,-74.1072,15.400000
201,41.0073,-74.1038,16.350000
202,41.0022,-74.1017,10.800000
203,40.9976,-74.0990,14.500000
204,40.9929,-74.0962,17.000000
205,40.9881,-74.0939,10.900000
206,40.9839,-74.0901,17.100000
207,40.9809,-74.0852,11.850000
208,40.9766,-74.0823,14.550000
209,40.9726,-74.0807,14.350000
210,40.9682,-74.0789,11.450000
211,40.9635,-74.0770,17.500000
212,40.9590,-74.0751,19.250000
213,40.9547,-74.0735,24.150000
214,40.9499,-74.0724,21.850000
215,40.9450,-74.0719,33.000000
216,40.9405,-74.0715,30.250000
217,40.9358,-74.0711,38.100000
218,40.9313,-74.0706,39.950000
219,40.9267,-74.0710,46.300000
220,40.9219,-74.0722,34.000000
221,40.9172,-74.0728,26.700000
222,40.9153,-74.0750,27.800000
223,40.9154,-74.0749,27.350000
224,40.9158,-74.0750,25.750000
225,40.9158,-74.0740,29.750000
226,40.9163,-74.0728,25.500000
227,40.9127,-74.0713,25.750000
228,40.9083,-74.0711,19.450000
229,40.9038,-74.0721,10.350000
230,40.8998,-74.0731,17.000000
231,40.8957,-74.0726,18.700000
232,40.8916,-74.0708,10.800000
233,40.8877,-74.0690,13.950000
234,40.8839,-74.0673,13.950000
235,40.8797,-74.0654,18.750000
236,40.8763,-74.0652,13.550000
237,40.8753,-74.0655,12.850000
238,40.8768,-74.0647,8.650000
239,40.8794,-74.0634,22.000000
240,40.8826,-74.0653,21.100000
241,40.8865,-74.0680,14.850000
242,40.8908,-74.0703,18.300000
243,40.8952,-74.0723,14.650000
244,40.8991,-74.0731,20.300000
245,40.9030,-74.0721,15.450000
246,40.9066,-74.0713,21.650000
247,40.9107,-74.0707,19.900000
248,40.9150,-74.0723,16.850000
249,40.9194,-74.0724,24.450000
250,40.9241,-74.0713,33.650000
251,40.9288,-74.0705,33.500000
252,40.9333,-74.0706,38.350000
253,40.9377,-74.0710,35.150000
254,40.9419,-74.0688,20.550000
255,40.9465,-74.0667,25.900000
256,40.9510,-74.0658,26.100000
307,40.8639,-74.1721,20.500000
308,40.8593,-74.1739,18.900000
309,40.8548,-74.1756,12.900000
310,40.8505,-74.1781,4.250000
311,40.8459,-74.1802,17.200000
312,40.8410,-74.1801,15.750000
313,40.8373,-74.1806,15.300000
314,40.8363,-74.1805,9.750000
315,40.9451,-74.0722,39.250000
316,40.9433,-74.0718,39.050000
317,40.9391,-74.0720,39.200000
318,40.9337,-74.0728,31.650000
319,40.9286,-74.0727,39.200000
320,40.9243,-74.0767,36.700000
321,40.9216,-74.0828,33.150000
322,40.9183,-74.0878,30.000000
323,40.9132,-74.0900,28.000000
324,40.9096,-74.0948,29.000000
325,40.9089,-74.0978,17.400000
326,40.9070,-74.1031,28.500000
327,40.9045,-74.1080,38.800000
328,40.9044,-74.1142,28.900000
329,40.9030,-74.1210,30.100000
330,40.9013,-74.1276,37.850000
331,40.9021,-74.1343,39.350000
332,40.9012,-74.1406,33.800000
333,40.9007,-74.1473,28.450000
334,40.9017,-74.1533,26.400000
335,40.9041,-74.1586,22.100000
336,40.9067,-74.1641,24.250000
337,40.9079,-74.1707,24.400000
338,40.9089,-74.1775,21.350000
339,40.9083,-74.1841,19.700000
340,40.9055,-74.1896,20.700000
341,40.9029,-74.1955,21.000000
342,40.8977,-74.1990,17.250000
343,40.8961,-74.2054,23.850000
344,40.8976,-74.2118,20.100000
345,40.8971,-74.2186,20.850000
346,40.8986,-74.2202,22.350000
347,40.8988,-74.2202,18.050000
348,40.8988,-74.2202,10.400000
349,40.8988,-74.2202,10.650000
350,40.8988,-74.2203,13.450000
351,40.8969,-74.2227,13.300000
352,40.8965,-74.2266,24.900000
353,40.8966,-74.2233,24.650000
354,40.8969,-74.2163,23.350000
355,40.8972,-74.2096,22.000000
356,40.8958,-74.2029,21.300000
357,40.8990,-74.1977,21.000000
358,40.9034,-74.1944,15.200000
359,40.9058,-74.1882,17.200000
360,40.9086,-74.1822,16.850000
361,40.9085,-74.1755,11.600000
362,40.9073,-74.1686,19.000000
363,40.9060,-74.1617,22.900000
364,40.9025,-74.1568,22.350000
365,40.9010,-74.1501,26.000000
366,40.9006,-74.1431,15.950000
367,40.9017,-74.1366,27.600000
368,40.9013,-74.1296,34.550000
369,40.9021,-74.1229,47.400000
370,40.9039,-74.1166,33.550000
371,40.9040,-74.1096,28.750000
372,40.9036,-74.1025,27.150000
373,40.9032,-74.0958,25.300000
374,40.9023,-74.0888,21.550000
375,40.9001,-74.0826,20.700000
376,40.8959,-74.0800,20.800000
377,40.8925,-74.0759,24.000000
378,40.8891,-74.0721,16.500000
379,40.8858,-74.0686,14.500000
380,40.8817,-74.0660,19.550000
381,40.8776,-74.0641,19.900000
382,40.8737,-74.0613,11.800000
383,40.8698,-74.0574,15.550000

08011.TXT Data

Logging started on: 08/02/01at 12:01:52 AM
Center Frequency: 5.300000E+2
Logging stopped on: 08/02/01at 12:56:18 AM

Entry,Latitude,Longitude,Level

1,40.8987,-74.2295,24.100000
2,40.8997,-74.2359,26.150000
3,40.8990,-74.2427,32.250000
4,40.8977,-74.2494,42.750000
5,40.8962,-74.2557,34.250000
6,40.8949,-74.2624,27.100000
7,40.8942,-74.2692,24.850000
8,40.8940,-74.2758,21.350000
9,40.8939,-74.2827,19.850000
10,40.8939,-74.2896,20.050000
11,40.8938,-74.2962,19.300000
12,40.8932,-74.3030,18.150000
13,40.8918,-74.3096,15.350000
14,40.8895,-74.3155,17.350000
15,40.8863,-74.3210,18.050000
16,40.8823,-74.3254,20.250000
17,40.8777,-74.3278,20.500000
18,40.8727,-74.3296,20.150000
19,40.8676,-74.3314,17.700000
20,40.8635,-74.3350,18.900000
21,40.8617,-74.3413,22.250000
22,40.8623,-74.3482,22.800000
23,40.8629,-74.3547,26.050000
24,40.8621,-74.3614,28.600000
25,40.8605,-74.3675,37.450000
26,40.8594,-74.3737,46.500000
27,40.8602,-74.3804,31.200000
28,40.8609,-74.3872,28.400000
29,40.8608,-74.3934,24.350000
30,40.8612,-74.4001,22.600000
31,40.8626,-74.4065,20.000000
32,40.8641,-74.4121,19.850000
33,40.8667,-74.4149,21.750000
34,40.8669,-74.4138,22.500000
35,40.8669,-74.4138,18.450000
36,40.8670,-74.4137,19.050000
37,40.8675,-74.4128,18.200000
38,40.8675,-74.4128,17.950000
39,40.8664,-74.4102,19.450000
40,40.8649,-74.4050,9.700000
41,40.8640,-74.3994,13.950000
42,40.8639,-74.3975,20.300000
43,40.8636,-74.3937,15.750000
44,40.8631,-74.3885,20.650000
45,40.8629,-74.3855,26.350000
46,40.8627,-74.3834,22.800000
47,40.8624,-74.3785,25.800000
48,40.8619,-74.3733,27.350000
49,40.8603,-74.3677,36.100000
50,40.8595,-74.3613,39.900000
51,40.8583,-74.3551,22.900000
52,40.8580,-74.3503,21.500000
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54,40.8584,-74.3425,16.300000
55,40.8587,-74.3370,14.200000
56,40.8590,-74.3317,12.900000
57,40.8592,-74.3263,14.750000
58,40.8618,-74.3219,15.600000
59,40.8647,-74.3177,13.600000
60,40.8672,-74.3134,14.950000
61,40.8678,-74.3122,17.600000
62,40.8687,-74.3100,16.600000
63,40.8711,-74.3057,9.750000
64,40.8745,-74.3018,9.150000
65,40.8779,-74.2978,15.100000
66,40.8810,-74.2930,13.400000
67,40.8839,-74.2874,13.850000
68,40.8867,-74.2818,15.550000
69,40.8891,-74.2757,16.500000
70,40.8913,-74.2694,18.600000
71,40.8926,-74.2635,18.150000
72,40.8931,-74.2580,24.150000
73,40.8935,-74.2526,28.700000
74,40.8944,-74.2473,34.200000
75,40.8946,-74.2413,36.600000
76,40.8947,-74.2355,30.400000
77,40.8939,-74.2299,22.450000
78,40.8927,-74.2242,20.950000
79,40.8900,-74.2197,15.950000
80,40.8868,-74.2165,20.700000
81,40.8838,-74.2123,17.950000
82,40.8813,-74.2083,14.000000
83,40.8789,-74.2060,10.100000
84,40.8792,-74.2043,6.200000
85,40.8810,-74.2074,15.200000
86,40.8839,-74.2122,14.950000
87,40.8871,-74.2167,18.500000
88,40.8909,-74.2205,20.000000
89,40.8931,-74.2251,13.400000
90,40.8942,-74.2304,12.300000
91,40.8950,-74.2362,23.450000
92,40.8952,-74.2414,29.250000
93,40.8949,-74.2463,33.150000
94,40.8967,-74.2493,40.350000
95,40.8980,-74.2530,38.800000
96,40.9022,-74.2560,20.500000
97,40.9068,-74.2591,27.750000
98,40.9107,-74.2634,22.900000
99,40.9156,-74.2656,22.200000
100,40.9207,-74.2677,20.650000
101,40.9257,-74.2683,16.350000
102,40.9308,-74.2687,17.450000
103,40.9326,-74.2689,17.350000
104,40.9344,-74.2690,15.050000
105,40.9383,-74.2696,14.350000
106,40.9426,-74.2715,11.200000
107,40.9463,-74.2738,13.650000
108,40.9490,-74.2747,13.200000
109,40.9489,-74.2753,9.300000
110,40.9489,-74.2754,9.400000
111,40.9477,-74.2753,12.650000
112,40.9440,-74.2724,15.150000
113,40.9399,-74.2704,7.800000
114,40.9352,-74.2694,10.750000
115,40.9309,-74.2690,11.900000
116,40.9260,-74.2686,10.000000
117,40.9211,-74.2681,16.100000
118,40.9162,-74.2659,14.800000
119,40.9111,-74.2640,21.750000
120,40.9074,-74.2599,22.100000
121,40.9032,-74.2569,23.500000
122,40.8989,-74.2541,28.200000
123,40.8949,-74.2516,34.050000
124,40.8932,-74.2557,31.550000
125,40.8920,-74.2521,30.050000
126,40.8910,-74.2503,30.800000
127,40.8890,-74.2476,28.000000
128,40.8862,-74.2457,25.650000
129,40.8847,-74.2448,22.600000
130,40.8827,-74.2437,13.650000
131,40.8804,-74.2423,13.800000
132,40.8768,-74.2403,15.300000
133,40.8756,-74.2396,16.900000
134,40.8756,-74.2396,12.500000
135,40.8756,-74.2396,12.700000
136,40.8756,-74.2396,12.550000
137,40.8734,-74.2383,11.350000
138,40.8703,-74.2364,11.450000

08021.TXT Data

Logging started on: 08/02/01at 6:51:45 PM
Center Frequency: 1.340000E+3
Logging stopped on: 08/02/01at 7:11:53 PM
Logging started on: 08/02/01at 7:26:32 PM
Center Frequency: 1.340000E+3
Logging stopped on: 08/02/01at 7:36:00 PM
Logging started on: 08/02/01at 7:43:55 PM
Center Frequency: 1.340000E+3
Logging stopped on: 08/02/01at 9:11:29 PM

Entry,Latitude,Longitude,Level
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2,40.6933,-74.2639,3.400000
3,40.6903,-74.2698,4.400000
4,40.6865,-74.2744,3.800000
5,40.6817,-74.2776,2.850000
6,40.6765,-74.2792,4.850000
7,40.6717,-74.2820,6.000000
8,40.6670,-74.2854,5.150000
9,40.6618,-74.2873,4.200000
10,40.6566,-74.2874,6.750000
11,40.6512,-74.2874,6.000000
12,40.6458,-74.2878,5.300000
13,40.6408,-74.2898,5.150000
14,40.6363,-74.2936,5.000000
15,40.6324,-74.2985,3.800000
16,40.6285,-74.3029,7.050000
17,40.6243,-74.3075,6.950000
18,40.6195,-74.3106,6.350000
19,40.6144,-74.3118,6.400000
20,40.6091,-74.3131,7.800000
21,40.6042,-74.3155,10.100000
22,40.5994,-74.3188,9.000000
23,40.5947,-74.3222,12.100000
24,40.5899,-74.3256,11.850000
25,40.5854,-74.3288,15.950000
26,40.5803,-74.3312,16.800000
27,40.5749,-74.3308,15.850000
28,40.5702,-74.3280,19.250000
29,40.5655,-74.3246,18.250000
30,40.5605,-74.3217,16.050000
31,40.5558,-74.3191,21.350000
32,40.5508,-74.3161,21.850000
33,40.5462,-74.3126,23.900000
34,40.5417,-74.3092,25.000000
35,40.5372,-74.3052,24.100000
36,40.5333,-74.3004,21.700000
37,40.5285,-74.2983,25.700000
38,40.5232,-74.3003,24.600000
39,40.5180,-74.3012,26.000000
40,40.5130,-74.3008,29.250000
41,40.5077,-74.3011,18.200000
42,40.5024,-74.3015,28.150000
43,40.4974,-74.3009,24.450000
44,40.4922,-74.3011,24.950000
45,40.4878,-74.3030,22.400000
46,40.4850,-74.3030,21.050000
47,40.4807,-74.3017,23.650000
48,40.4758,-74.2992,23.800000
49,40.4712,-74.2958,16.850000
50,40.4676,-74.2914,16.200000
51,40.4661,-74.2891,13.100000
52,40.4659,-74.2889,12.450000
53,40.4660,-74.2883,12.250000
54,40.4671,-74.2895,11.950000
55,40.4700,-74.2936,15.200000
56,40.4741,-74.2976,17.200000
57,40.4790,-74.3006,13.500000
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103,40.5851,-74.2807,16.100000
104,40.5845,-74.2812,15.350000
105,40.5834,-74.2821,11.150000
106,40.5832,-74.2823,5.200000
107,40.5830,-74.2826,5.850000
108,40.5820,-74.2834,10.050000
109,40.5816,-74.2838,11.600000
110,40.5816,-74.2838,9.600000
111,40.5805,-74.2847,13.050000
112,40.5800,-74.2851,13.150000
113,40.5794,-74.2857,8.850000
114,40.5787,-74.2863,10.200000
115,40.5785,-74.2865,8.600000
116,40.5775,-74.2873,8.950000
117,40.5752,-74.2894,10.550000
118,40.5726,-74.2920,15.650000
119,40.5702,-74.2942,20.100000
120,40.5670,-74.2970,13.700000
121,40.5637,-74.2998,16.400000
122,40.5615,-74.3021,21.250000
123,40.5585,-74.3058,9.500000
124,40.5565,-74.3098,7.350000
125,40.5543,-74.3144,13.700000
126,40.5520,-74.3186,14.800000
127,40.5507,-74.3210,14.750000
128,40.5503,-74.3216,10.600000
129,40.5503,-74.3216,10.650000
130,40.5495,-74.3231,10.900000
131,40.5476,-74.3266,18.750000
132,40.5458,-74.3297,21.600000
133,40.5453,-74.3307,24.900000
134,40.5444,-74.3324,18.600000
135,40.5440,-74.3331,11.000000
136,40.5432,-74.3342,13.400000
137,40.5430,-74.3346,9.250000
138,40.5424,-74.3353,17.650000
139,40.5410,-74.3372,22.300000
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143,40.5322,-74.3492,31.800000
144,40.5288,-74.3540,38.250000
145,40.5253,-74.3587,46.250000
146,40.5221,-74.3630,43.200000
147,40.5188,-74.3675,37.850000
148,40.5165,-74.3719,30.900000
149,40.5156,-74.3742,35.700000
150,40.5155,-74.3742,35.200000
151,40.5151,-74.3752,34.750000
152,40.5132,-74.3798,35.600000
153,40.5112,-74.3846,34.500000
154,40.5098,-74.3878,28.900000
155,40.5077,-74.3923,26.500000
156,40.5054,-74.3965,29.550000
199,40.5385,-74.4416,3.350000
200,40.5407,-74.4383,8.050000
201,40.5420,-74.4389,11.500000
202,40.5420,-74.4389,14.600000
203,40.5420,-74.4389,14.350000
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205,40.5471,-74.4424,16.400000
206,40.5504,-74.4440,6.750000
207,40.5526,-74.4447,14.000000
208,40.5526,-74.4447,16.350000
209,40.5526,-74.4447,16.400000
210,40.5548,-74.4455,17.900000
211,40.5574,-74.4459,16.800000
212,40.5574,-74.4462,13.250000
213,40.5574,-74.4462,13.400000
214,40.5572,-74.4468,13.150000
215,40.5560,-74.4504,17.900000
216,40.5564,-74.4573,16.650000
217,40.5569,-74.4644,16.950000
218,40.5570,-74.4712,15.050000
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223,40.5505,-74.4854,7.100000
224,40.5531,-74.4854,10.200000
225,40.5544,-74.4820,12.300000
226,40.5550,-74.4803,12.000000
227,40.5555,-74.4786,12.650000
228,40.5560,-74.4759,13.650000
229,40.5565,-74.4720,15.300000
230,40.5567,-74.4673,12.650000
231,40.5566,-74.4640,11.450000
232,40.5564,-74.4616,18.150000
233,40.5562,-74.4588,17.800000
234,40.5560,-74.4558,19.550000
235,40.5558,-74.4536,17.750000
236,40.5557,-74.4517,17.700000
237,40.5556,-74.4497,17.750000
238,40.5554,-74.4475,18.100000
239,40.5553,-74.4452,16.200000
240,40.5555,-74.4415,17.750000
241,40.5558,-74.4397,20.300000
242,40.5560,-74.4386,19.600000
243,40.5565,-74.4362,19.650000
244,40.5572,-74.4328,19.550000
245,40.5576,-74.4298,19.100000
246,40.5576,-74.4265,18.800000
247,40.5571,-74.4231,18.650000
248,40.5567,-74.4218,17.200000
249,40.5555,-74.4188,17.400000
250,40.5543,-74.4163,21.200000
251,40.5530,-74.4134,23.050000
252,40.5518,-74.4109,22.400000
253,40.5504,-74.4081,23.050000
254,40.5494,-74.4058,22.750000
255,40.5484,-74.4036,24.500000

58,40.4841,-74.3021,23.450000
59,40.4877,-74.3025,22.400000
60,40.4890,-74.3020,21.300000
61,40.4932,-74.3003,21.250000
62,40.4985,-74.3007,24.600000
63,40.5042,-74.3011,24.500000
64,40.5094,-74.3007,29.150000
65,40.5143,-74.3006,30.700000
66,40.5193,-74.3004,27.150000
67,40.5199,-74.2968,22.400000
68,40.5204,-74.2939,19.050000
69,40.5242,-74.2895,22.700000
70,40.5280,-74.2851,17.100000
71,40.5289,-74.2785,18.800000
72,40.5270,-74.2719,15.200000
73,40.5252,-74.2662,16.600000
74,40.5272,-74.2631,16.800000
75,40.5258,-74.2649,18.600000
76,40.5255,-74.2975,15.150000
77,40.5287,-74.2974,24.150000
78,40.5332,-74.2973,23.250000
79,40.5376,-74.2956,23.850000
80,40.5417,-74.2922,17.900000
81,40.5468,-74.2911,19.750000
82,40.5513,-74.2909,11.400000
83,40.5556,-74.2925,21.600000
84,40.5588,-74.2950,20.750000
85,40.5629,-74.2967,14.800000
86,40.5670,-74.2968,14.100000
87,40.5709,-74.2934,16.400000
88,40.5745,-74.2899,17.450000
89,40.5763,-74.2882,8.350000
90,40.5791,-74.2858,10.500000
91,40.5823,-74.2830,16.900000
92,40.5857,-74.2800,10.550000
93,40.5898,-74.2764,20.150000
94,40.5944,-74.2732,7.700000
95,40.5984,-74.2712,3.100000
96,40.5988,-74.2710,0.700000
97,40.5988,-74.2710,0.500000
98,40.5989,-74.2710,0.600000
99,40.5984,-74.2715,0.500000
157,40.5044,-74.3984,19.650000
158,40.5025,-74.4021,12.600000
159,40.5004,-74.4061,12.000000
160,40.4981,-74.4105,22.700000
161,40.4944,-74.4129,22.900000
162,40.4901,-74.4137,24.750000
163,40.4860,-74.4160,19.950000
164,40.4826,-74.4190,17.550000
165,40.4789,-74.4226,17.400000
166,40.4754,-74.4269,9.400000
167,40.4720,-74.4312,12.000000
168,40.4699,-74.4344,12.200000
169,40.4681,-74.4375,6.900000
170,40.4676,-74.4365,10.200000
171,40.4695,-74.4337,19.200000
172,40.4730,-74.4295,10.150000
173,40.4766,-74.4251,10.100000
174,40.4803,-74.4207,11.300000
175,40.4840,-74.4173,18.200000
176,40.4829,-74.4168,12.900000
177,40.4849,-74.4202,19.350000
178,40.4858,-74.4256,17.600000
179,40.4868,-74.4308,15.250000
180,40.4890,-74.4365,20.200000
181,40.4896,-74.4371,18.850000
182,40.4906,-74.4377,18.950000
183,40.4948,-74.4393,24.750000
184,40.4994,-74.4407,18.100000
185,40.5027,-74.4456,18.450000
186,40.5060,-74.4510,14.900000
187,40.5075,-74.4575,19.300000
188,40.5114,-74.4584,22.950000
189,40.5127,-74.4582,19.000000
190,40.5160,-74.4573,12.800000
191,40.5179,-74.4540,13.450000
192,40.5213,-74.4514,15.700000
193,40.5229,-74.4500,19.700000
194,40.5253,-74.4481,21.700000
195,40.5292,-74.4450,20.800000
196,40.5317,-74.4429,19.200000
197,40.5335,-74.4450,19.750000
198,40.5364,-74.4456,16.950000
256,40.5466,-74.3998,22.850000
257,40.5444,-74.3952,24.450000
258,40.5419,-74.3906,27.100000
259,40.5386,-74.3852,29.350000
260,40.5355,-74.3801,33.500000
261,40.5320,-74.3744,35.250000
262,40.5289,-74.3681,36.900000
263,40.5276,-74.3611,42.800000
264,40.5282,-74.3548,51.650000
265,40.5286,-74.3524,39.450000
266,40.5290,-74.3501,37.700000
267,40.5294,-74.3472,35.900000
268,40.5295,-74.3452,37.750000
269,40.5294,-74.3426,39.200000
270,40.5293,-74.3419,36.950000
271,40.5291,-74.3408,35.850000
272,40.5289,-74.3394,35.750000
273,40.5286,-74.3380,34.700000
274,40.5284,-74.3373,34.700000
275,40.5281,-74.3358,34.750000
276,40.5279,-74.3347,33.350000
277,40.5276,-74.3336,32.700000
278,40.5275,-74.3331,35.150000
279,40.5273,-74.3323,34.550000
280,40.5270,-74.3311,32.000000
281,40.5269,-74.3304,4.450000
282,40.5267,-74.3298,31.250000
283,40.5265,-74.3286,19.400000
284,40.5263,-74.3273,31.900000
285,40.5262,-74.3261,31.000000
286,40.5260,-74.3244,29.200000
287,40.5258,-74.3222,28.250000
288,40.5255,-74.3195,27.500000
289,40.5248,-74.3161,25.400000
290,40.5240,-74.3133,26.400000
291,40.5226,-74.3099,27.800000
292,40.5213,-74.3075,24.350000
293,40.5201,-74.3050,17.950000
294,40.5199,-74.3045,24.400000
295,40.5197,-74.3038,22.950000
296,40.5194,-74.3033,25.250000
297,40.5193,-74.3026,22.250000

08031.TXT Data

Logging started on: 08/03/01at 6:40:30 PM
Center Frequency: 5.900000E+2
Logging stopped on: 08/03/01at 7:27:26 PM

Entry,Latitude,Longitude,Level
1,40.8606,-73.9709,21.250000
2,40.8605,-73.9710,20.500000
3,40.8605,-73.9710,19.850000
4,40.8610,-73.9689,16.750000
5,40.8610,-73.9687,18.350000
6,40.8612,-73.9673,18.400000
7,40.8599,-73.9622,20.050000
8,40.8614,-73.9579,18.150000
9,40.8653,-73.9547,18.200000
10,40.8698,-73.9536,14.400000
11,40.8741,-73.9509,16.850000
12,40.8788,-73.9492,16.750000
13,40.8799,-73.9474,14.800000
14,40.8798,-73.9498,12.150000
15,40.8803,-73.9487,14.850000
16,40.8758,-73.9506,14.850000
17,40.8714,-73.9529,12.400000
18,40.8671,-73.9545,13.750000
19,40.8627,-73.9568,14.700000
20,40.8597,-73.9612,17.900000
21,40.8615,-73.9661,18.450000
22,40.8607,-73.9699,7.900000
41,40.8673,-74.0369,22.900000
42,40.8673,-74.0435,20.650000
43,40.8677,-74.0499,18.850000
44,40.8694,-74.0558,18.350000
45,40.8727,-74.0596,17.550000
46,40.8763,-74.0622,15.750000
47,40.8792,-74.0636,11.500000
48,40.8819,-74.0650,10.200000
49,40.8836,-74.0658,11.950000
50,40.8847,-74.0664,9.500000
51,40.8860,-74.0674,9.300000
52,40.8867,-74.0681,3.850000
53,40.8880,-74.0690,10.200000
54,40.8892,-74.0696,8.200000
55,40.8901,-74.0700,12.250000
56,40.8904,-74.0701,10.200000
57,40.8918,-74.0708,11.550000
58,40.8940,-74.0718,10.450000
59,40.8968,-74.0730,8.850000
60,40.8992,-74.0731,7.750000
61,40.9030,-74.0722,11.500000
62,40.9078,-74.0711,4.300000
81,40.8887,-73.9976,22.550000
82,40.8860,-73.9925,22.950000
83,40.8828,-73.9876,18.200000
84,40.8803,-73.9833,20.350000
85,40.8776,-73.9786,23.400000
86,40.8749,-73.9741,21.850000
87,40.8714,-73.9724,17.100000
88,40.8672,-73.9737,17.200000
89,40.8635,-73.9749,18.400000
90,40.8628,-73.9752,19.550000
91,40.8621,-73.9754,16.750000
92,40.8618,-73.9754,18.350000
93,40.8612,-73.9756,20.850000
94,40.8609,-73.9757,17.050000
95,40.8605,-73.9759,18.450000
96,40.8603,-73.9760,20.250000
97,40.8600,-73.9761,19.100000
98,40.8599,-73.9761,18.900000
99,40.8598,-73.9761,18.400000
100,40.8595,-73.9763,20.150000
101,40.8590,-73.9763,16.200000
102,40.8585,-73.9764,13.250000

23,40.8605,-73.9704,11.500000
24,40.8602,-73.9709,11.500000
25,40.8591,-73.9723,12.700000
26,40.8591,-73.9723,11.250000
27,40.8586,-73.9727,11.550000
28,40.8578,-73.9733,16.400000
29,40.8618,-73.9743,16.600000
30,40.8665,-73.9750,18.600000
31,40.8709,-73.9784,7.950000
32,40.8746,-73.9833,25.450000
33,40.8759,-73.9895,29.200000
34,40.8741,-73.9960,29.350000
35,40.8708,-74.0013,35.550000
36,40.8673,-74.0057,48.250000
37,40.8656,-74.0118,34.250000
38,40.8657,-74.0176,28.600000
39,40.8666,-74.0238,22.750000
40,40.8674,-74.0305,19.850000
63,40.9126,-74.0711,10.400000
64,40.9176,-74.0724,9.300000
65,40.9199,-74.0691,11.700000
66,40.9185,-74.0634,5.500000
67,40.9170,-74.0580,7.250000
68,40.9156,-74.0529,8.550000
69,40.9143,-74.0480,8.350000
70,40.9130,-74.0432,9.250000
71,40.9106,-74.0384,9.500000
72,40.9072,-74.0344,13.100000
73,40.9032,-74.0306,9.700000
74,40.8994,-74.0265,15.400000
75,40.8968,-74.0215,8.800000
76,40.8959,-74.0190,9.200000
77,40.8949,-74.0163,0.950000
78,40.8935,-74.0124,18.250000
79,40.8921,-74.0082,17.150000
80,40.8904,-74.0029,12.700000
103,40.8580,-73.9762,1.350000
104,40.8578,-73.9760,20.100000
105,40.8573,-73.9751,20.400000
106,40.8581,-73.9738,19.400000
107,40.8585,-73.9779,21.900000
108,40.8569,-73.9822,22.150000
109,40.8533,-73.9848,20.700000
110,40.8496,-73.9875,22.600000
111,40.8458,-73.9913,21.550000
112,40.8420,-73.9956,19.450000
113,40.8425,-74.0005,17.800000
114,40.8437,-74.0052,8.350000
115,40.8446,-74.0111,22.050000
116,40.8467,-74.0148,20.550000
117,40.8482,-74.0188,16.700000
118,40.8464,-74.0180,21.450000
119,40.8418,-74.0183,22.700000

08032.TXT Data

Logging started on: 08/03/01at 7:28:18 PM
Center Frequency: 1.610000E+3
Logging stopped on: 08/03/01at 7:41:05 PM

Entry,Latitude,Longitude,Level
1,40.8360,-74.0209,28.400000
2,40.8315,-74.0229,11.150000
3,40.8272,-74.0262,17.800000
4,40.8223,-74.0275,18.600000
5,40.8176,-74.0282,20.650000
6,40.8128,-74.0292,9.400000
7,40.8082,-74.0312,16.400000
8,40.8040,-74.0341,22.750000
9,40.8000,-74.0379,13.600000
10,40.7960,-74.0418,29.250000
11,40.7924,-74.0453,23.400000
12,40.7890,-74.0490,10.450000
13,40.7859,-74.0519,12.400000
14,40.7828,-74.0527,12.800000
15,40.7828,-74.0527,21.650000
16,40.7828,-74.0527,28.750000
17,40.7822,-74.0527,26.550000
18,40.7818,-74.0546,27.350000
19,40.7837,-74.0530,28.850000
20,40.7847,-74.0520,12.650000
21,40.7851,-74.0510,16.250000
22,40.7851,-74.0510,24.000000
23,40.7851,-74.0510,21.850000
24,40.7840,-74.0488,14.400000
25,40.7825,-74.0461,8.150000
26,40.7853,-74.0477,17.900000
27,40.7886,-74.0501,17.950000
28,40.7917,-74.0544,13.100000
29,40.7946,-74.0586,31.100000
30,40.7980,-74.0633,14.500000
31,40.8010,-74.0674,12.400000
32,40.8038,-74.0713,24.000000

08033.TXT Data

Logging started on: 08/03/01at 11:10:34 PM
Center Frequency: 1.380000E+3
Logging stopped on: 08/04/01at 12:23:56 AM

Entry,Latitude,Longitude,Level
1,40.3361,-74.6167,17.950000
2,40.3361,-74.6166,18.100000
3,40.3363,-74.6171,17.500000
4,40.3348,-74.6154,19.350000
5,40.3329,-74.6104,11.500000
6,40.3331,-74.6074,3.500000
7,40.3337,-74.6121,6.400000
8,40.3358,-74.6172,12.950000
9,40.3399,-74.6160,21.150000
10,40.3395,-74.6119,19.750000
11,40.3405,-74.6060,17.300000
12,40.3405,-74.6000,14.200000
13,40.3384,-74.5945,12.800000
14,40.3361,-74.5891,5.450000
15,40.3351,-74.5865,4.000000
16,40.3366,-74.5899,7.900000
17,40.3382,-74.5939,5.150000
18,40.3398,-74.5978,14.900000
19,40.3407,-74.5999,12.650000
20,40.3408,-74.6053,14.750000
21,40.3396,-74.6111,17.150000
22,40.3404,-74.6156,20.300000
63,40.2355,-74.7469,16.550000
64,40.2328,-74.7450,14.300000
65,40.2312,-74.7461,4.500000
66,40.2296,-74.7494,7.550000
67,40.2272,-74.7525,8.150000
68,40.2256,-74.7543,1.800000
69,40.2247,-74.7573,7.600000
70,40.2239,-74.7586,10.500000
71,40.2279,-74.7575,5.700000
72,40.2312,-74.7527,13.300000
73,40.2347,-74.7477,14.200000
74,40.2379,-74.7427,15.300000
75,40.2412,-74.7377,14.150000
76,40.2451,-74.7333,14.500000
77,40.2480,-74.7282,14.700000
78,40.2514,-74.7231,18.350000
79,40.2557,-74.7190,17.550000
80,40.2607,-74.7166,19.450000
81,40.2661,-74.7152,22.950000
82,40.2707,-74.7114,24.750000
83,40.2740,-74.7073,21.100000
84,40.2759,-74.7051,32.900000
125,40.2918,-74.7719,14.300000
126,40.2895,-74.7659,13.050000
127,40.2874,-74.7594,15.650000
128,40.2867,-74.7525,15.250000
129,40.2870,-74.7457,15.750000
130,40.2863,-74.7388,18.850000
131,40.2845,-74.7333,25.800000
132,40.2816,-74.7317,22.400000
133,40.2795,-74.7321,22.700000
134,40.2772,-74.7326,18.300000
135,40.2735,-74.7341,9.800000
136,40.2710,-74.7374,8.150000
137,40.2715,-74.7367,7.400000
138,40.2751,-74.7330,12.200000
139,40.2796,-74.7320,17.500000
140,40.2834,-74.7317,20.750000
141,40.2883,-74.7332,29.750000
142,40.2916,-74.7341,22.400000
143,40.2940,-74.7327,15.350000
144,40.2963,-74.7308,17.100000
145,40.2976,-74.7296,7.800000
146,40.2997,-74.7277,21.550000

23,40.3405,-74.6160,20.450000
24,40.3424,-74.6204,21.150000
25,40.3447,-74.6244,15.250000
26,40.3413,-74.6264,19.950000
27,40.3384,-74.6298,7.150000
28,40.3373,-74.6311,16.000000
29,40.3351,-74.6338,13.350000
30,40.3329,-74.6364,21.400000
31,40.3323,-74.6371,21.300000
32,40.3308,-74.6389,20.700000
33,40.3277,-74.6428,21.800000
34,40.3239,-74.6473,24.550000
35,40.3206,-74.6514,21.550000
36,40.3181,-74.6543,33.300000
37,40.3154,-74.6576,28.400000
38,40.3139,-74.6595,30.800000
39,40.3124,-74.6612,26.600000
40,40.3095,-74.6647,40.100000
41,40.3063,-74.6686,36.400000
42,40.3030,-74.6726,38.100000
43,40.2995,-74.6768,43.750000
44,40.2961,-74.6809,51.350000
45,40.2928,-74.6850,44.850000
46,40.2894,-74.6890,47.100000
47,40.2861,-74.6930,38.050000
48,40.2825,-74.6974,26.800000
49,40.2790,-74.7016,32.700000
50,40.2757,-74.7056,19.050000
51,40.2724,-74.7095,20.750000
52,40.2692,-74.7134,17.600000
53,40.2655,-74.7154,23.600000
54,40.2608,-74.7167,23.500000
55,40.2565,-74.7188,19.150000
56,40.2525,-74.7217,16.750000
57,40.2495,-74.7264,17.700000
58,40.2465,-74.7312,16.800000
59,40.2434,-74.7355,13.900000
60,40.2403,-74.7396,14.350000
61,40.2373,-74.7441,16.050000
62,40.2371,-74.7465,17.000000
85,40.2787,-74.7017,20.400000
86,40.2818,-74.6977,32.100000
87,40.2799,-74.6928,36.150000
88,40.2746,-74.6911,29.750000
89,40.2693,-74.6919,26.450000
90,40.2641,-74.6929,20.250000
91,40.2586,-74.6940,21.050000
92,40.2538,-74.6959,16.900000
93,40.2488,-74.6985,11.800000
94,40.2442,-74.7009,15.450000
95,40.2414,-74.7032,12.550000
96,40.2419,-74.7004,6.900000
97,40.2408,-74.6982,3.950000
98,40.2422,-74.7005,4.200000
99,40.2468,-74.6991,14.800000
100,40.2517,-74.6965,15.650000
101,40.2568,-74.6941,16.250000
102,40.2618,-74.6929,18.050000
103,40.2672,-74.6919,16.450000
104,40.2725,-74.6909,24.750000
105,40.2776,-74.6912,26.400000
106,40.2823,-74.6943,33.950000
107,40.2855,-74.6999,36.750000
108,40.2866,-74.7060,30.100000
109,40.2862,-74.7121,24.400000
110,40.2859,-74.7183,23.450000
111,40.2856,-74.7245,27.500000
112,40.2859,-74.7313,21.650000
113,40.2864,-74.7374,20.600000
114,40.2872,-74.7434,18.250000
115,40.2870,-74.7498,18.150000
116,40.2872,-74.7563,15.300000
117,40.2887,-74.7625,13.900000
118,40.2922,-74.7678,15.600000
119,40.2926,-74.7744,11.450000
120,40.2918,-74.7803,10.750000
121,40.2922,-74.7834,11.550000
122,40.2901,-74.7849,8.650000
123,40.2902,-74.7856,11.450000
124,40.2912,-74.7790,11.150000
147,40.2995,-74.7280,15.550000
148,40.2982,-74.7292,18.750000
149,40.2967,-74.7306,8.650000
150,40.2937,-74.7331,10.400000
151,40.2906,-74.7339,7.750000
152,40.2896,-74.7336,9.500000
153,40.2856,-74.7324,25.100000
154,40.2857,-74.7324,22.600000
155,40.2854,-74.7265,25.250000
156,40.2855,-74.7194,28.150000
157,40.2859,-74.7126,28.800000
158,40.2863,-74.7060,28.600000
159,40.2849,-74.6995,32.300000
160,40.2821,-74.6961,37.050000
161,40.2852,-74.6936,32.700000
162,40.2893,-74.6890,37.400000
163,40.2935,-74.6838,39.950000
164,40.2976,-74.6789,48.150000
165,40.3014,-74.6743,46.450000
166,40.3016,-74.6741,43.500000
167,40.3029,-74.6725,43.500000
168,40.3066,-74.6680,36.500000
169,40.3099,-74.6640,30.400000
170,40.3119,-74.6615,31.200000
171,40.3125,-74.6608,34.400000
172,40.3152,-74.6575,29.550000
173,40.3186,-74.6534,29.850000
174,40.3228,-74.6484,26.200000
175,40.3268,-74.6437,18.000000
176,40.3305,-74.6391,23.200000
177,40.3343,-74.6346,18.250000
178,40.3380,-74.6300,15.950000
179,40.3414,-74.6258,14.950000
180,40.3451,-74.6214,15.450000
181,40.3487,-74.6171,13.450000
182,40.3520,-74.6130,11.050000
183,40.3558,-74.6084,9.050000
184,40.3573,-74.6043,10.000000
185,40.3576,-74.6076,18.250000
186,40.3581,-74.6113,19.350000

08061.TXT Data

Logging started on: 08/06/01at 4:40:41 PM
Center Frequency: 5.300000E+2
Logging stopped on: 08/06/01at 6:13:01 PM

Entry,Latitude,Longitude,Level
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3,40.7409,-74.1778,6.000000
4,40.7402,-74.1760,7.450000
5,40.7390,-74.1752,14.250000
6,40.7373,-74.1762,9.050000
7,40.7372,-74.1763,6.600000
8,40.7372,-74.1763,6.350000
9,40.7358,-74.1769,17.850000
10,40.7329,-74.1782,4.050000
11,40.7324,-74.1785,9.050000
12,40.7316,-74.1768,15.250000
13,40.7309,-74.1756,12.500000
14,40.7309,-74.1756,10.900000
15,40.7305,-74.1752,11.850000
16,40.7285,-74.1763,18.750000
17,40.7281,-74.1765,22.700000
18,40.7280,-74.1766,22.000000
19,40.7259,-74.1779,22.750000
20,40.7235,-74.1793,20.950000
21,40.7214,-74.1805,22.150000
22,40.7214,-74.1805,19.550000
23,40.7210,-74.1808,20.150000
24,40.7210,-74.1808,20.100000
25,40.7202,-74.1798,17.000000
79,40.6432,-74.2042,15.800000
80,40.6473,-74.2022,20.400000
81,40.6510,-74.1975,11.650000
82,40.6539,-74.1920,20.500000
83,40.6577,-74.1874,20.700000
84,40.6622,-74.1843,23.350000
85,40.6665,-74.1808,19.950000
86,40.6707,-74.1768,23.100000
87,40.6750,-74.1728,22.550000
88,40.6794,-74.1696,26.250000
89,40.6840,-74.1664,26.850000
90,40.6887,-74.1631,27.600000
91,40.6932,-74.1600,24.300000
92,40.6978,-74.1566,21.350000
93,40.7026,-74.1539,21.150000
94,40.7071,-74.1511,20.100000
95,40.7111,-74.1467,19.650000
96,40.7136,-74.1406,18.000000
97,40.7169,-74.1357,16.350000
98,40.7220,-74.1345,14.050000
99,40.7266,-74.1313,13.500000
100,40.7304,-74.1270,16.250000
101,40.7348,-74.1241,14.900000
102,40.7390,-74.1237,12.650000
103,40.7428,-74.1226,16.400000
157,40.6990,-74.2385,0.900000
158,40.6993,-74.2335,13.050000
159,40.6983,-74.2268,17.850000
160,40.6970,-74.2209,11.850000
161,40.6975,-74.2158,14.400000
162,40.6999,-74.2114,12.400000
163,40.7021,-74.2069,20.400000
164,40.7050,-74.2021,16.200000
165,40.7076,-74.1969,20.450000
166,40.7079,-74.1911,26.750000
167,40.7073,-74.1848,27.050000
168,40.7048,-74.1835,26.900000
169,40.7015,-74.1856,28.600000
170,40.6985,-74.1865,29.700000
171,40.6960,-74.1881,35.250000
172,40.6932,-74.1864,38.050000
173,40.6917,-74.1839,37.450000
174,40.6890,-74.1838,35.250000
175,40.6882,-74.1810,31.900000
176,40.6903,-74.1781,32.550000
177,40.6934,-74.1773,31.450000
178,40.6944,-74.1776,28.650000
179,40.6946,-74.1778,20.450000
180,40.6952,-74.1798,10.350000
181,40.6934,-74.1829,29.600000

26,40.7202,-74.1798,24.900000
27,40.7202,-74.1798,21.300000
28,40.7202,-74.1798,23.450000
29,40.7196,-74.1781,17.800000
30,40.7197,-74.1784,17.250000
31,40.7198,-74.1787,15.050000
32,40.7198,-74.1789,18.500000
33,40.7200,-74.1793,18.400000
34,40.7192,-74.1805,24.250000
35,40.7180,-74.1819,21.100000
36,40.7156,-74.1839,24.750000
37,40.7122,-74.1829,25.650000
38,40.7088,-74.1812,25.850000
39,40.7051,-74.1832,29.750000
40,40.7014,-74.1857,30.600000
41,40.6978,-74.1876,32.100000
42,40.6939,-74.1897,34.300000
43,40.6901,-74.1920,32.250000
44,40.6858,-74.1930,25.700000
45,40.6818,-74.1941,24.550000
46,40.6781,-74.1967,23.700000
47,40.6778,-74.1970,20.300000
48,40.6777,-74.1971,19.750000
49,40.6754,-74.1989,18.700000
50,40.6720,-74.2011,19.550000
51,40.6694,-74.2026,16.000000
52,40.6691,-74.2028,15.700000
53,40.6679,-74.2035,13.450000
54,40.6644,-74.2057,14.950000
55,40.6606,-74.2083,6.050000
56,40.6564,-74.2108,21.300000
57,40.6531,-74.2133,12.750000
58,40.6521,-74.2163,11.350000
59,40.6510,-74.2204,11.500000
60,40.6486,-74.2238,12.850000
61,40.6458,-74.2263,6.300000
62,40.6420,-74.2297,11.300000
63,40.6380,-74.2332,14.150000
64,40.6338,-74.2367,7.250000
65,40.6308,-74.2395,6.100000
66,40.6289,-74.2412,6.350000
67,40.6289,-74.2412,7.200000
68,40.6289,-74.2412,7.150000
69,40.6306,-74.2394,4.250000
70,40.6344,-74.2358,2.650000
71,40.6359,-74.2343,5.800000
72,40.6380,-74.2326,7.350000
73,40.6401,-74.2273,10.550000
74,40.6421,-74.2212,13.700000
75,40.6432,-74.2144,13.200000
76,40.6410,-74.2112,12.850000
77,40.6406,-74.2097,10.150000
78,40.6402,-74.2067,7.750000
104,40.7474,-74.1209,17.900000
105,40.7524,-74.1188,17.300000
106,40.7549,-74.1163,15.100000
107,40.7547,-74.1209,6.650000
108,40.7541,-74.1247,14.400000
109,40.7507,-74.1283,12.400000
110,40.7467,-74.1321,12.400000
111,40.7447,-74.1377,12.950000
112,40.7432,-74.1440,15.650000
113,40.7425,-74.1506,14.150000
114,40.7433,-74.1569,12.100000
115,40.7470,-74.1617,17.350000
116,40.7481,-74.1663,12.850000
117,40.7478,-74.1694,19.600000
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119,40.7477,-74.1679,7.350000
120,40.7469,-74.1674,7.750000
121,40.7454,-74.1671,17.200000
122,40.7436,-74.1673,17.550000
123,40.7415,-74.1661,16.350000
124,40.7412,-74.1659,11.800000
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130,40.7348,-74.1664,1.400000
131,40.7348,-74.1664,1.000000
132,40.7345,-74.1665,0.700000
133,40.7324,-74.1672,11.700000
134,40.7316,-74.1677,11.650000
135,40.7294,-74.1700,10.200000
136,40.7269,-74.1725,14.400000
137,40.7248,-74.1747,13.250000
138,40.7224,-74.1772,14.150000
139,40.7200,-74.1797,18.400000
140,40.7187,-74.1811,21.300000
141,40.7170,-74.1831,21.950000
142,40.7142,-74.1838,23.900000
143,40.7110,-74.1823,25.750000
144,40.7085,-74.1826,28.350000
145,40.7082,-74.1873,27.750000
146,40.7080,-74.1936,27.150000
147,40.7067,-74.1996,27.700000
148,40.7036,-74.2048,25.300000
149,40.7004,-74.2100,8.850000
150,40.6981,-74.2151,2.700000
151,40.6970,-74.2205,10.750000
152,40.6980,-74.2257,13.600000
153,40.6993,-74.2311,8.250000
154,40.6993,-74.2370,18.450000
155,40.7003,-74.2388,8.850000
156,40.6983,-74.2390,9.150000
182,40.6934,-74.1855,42.350000
183,40.6958,-74.1848,42.850000
184,40.6996,-74.1838,36.450000
185,40.7040,-74.1830,33.200000
186,40.7065,-74.1783,30.200000
187,40.7113,-74.1777,27.500000
188,40.7108,-74.1811,26.800000
189,40.7089,-74.1876,25.700000
190,40.7099,-74.1942,27.650000
191,40.7128,-74.1994,23.550000
192,40.7153,-74.2051,19.600000
193,40.7166,-74.2113,18.400000
194,40.7166,-74.2174,17.950000
195,40.7144,-74.2235,19.900000
196,40.7102,-74.2283,14.850000
197,40.7072,-74.2339,17.700000
198,40.7053,-74.2406,16.900000
199,40.7059,-74.2474,16.100000
200,40.7079,-74.2506,13.250000
201,40.7093,-74.2478,13.750000
202,40.7107,-74.2441,15.250000
203,40.7150,-74.2418,14.250000
204,40.7184,-74.2365,13.100000
205,40.7217,-74.2315,13.250000
206,40.7258,-74.2271,17.050000
207,40.7298,-74.2230,3.250000
208,40.7343,-74.2199,17.250000
209,40.7391,-74.2167,11.600000
210,40.7435,-74.2140,17.150000
211,40.7485,-74.2125,19.500000
212,40.7532,-74.2108,13.650000
213,40.7553,-74.2081,11.050000
214,40.7570,-74.2050,11.700000
215,40.7560,-74.2007,4.200000
216,40.7531,-74.1949,15.200000
217,40.7514,-74.1882,8.900000
218,40.7506,-74.1869,17.350000
219,40.7506,-74.1869,17.250000
220,40.7500,-74.1868,17.250000
221,40.7485,-74.1878,4.850000
222,40.7480,-74.1882,5.150000
223,40.7480,-74.1882,6.400000
224,40.7473,-74.1887,4.350000
225,40.7473,-74.1887,10.450000
226,40.7470,-74.1885,10.050000
227,40.7462,-74.1848,14.400000
228,40.7458,-74.1835,16.900000
229,40.7452,-74.1815,18.350000
230,40.7448,-74.1803,15.500000
231,40.7437,-74.1804,10.000000
232,40.7422,-74.1813,14.000000
233,40.7417,-74.1804,9.650000
234,40.7417,-74.1793,2.950000

09041.TXT Data

Logging started on: 09/04/01at 9:01:32 PM
Center Frequency: 5:900000E+2
Logging stopped on: 09/04/01at 9:13:52 PM
Logging started on: 09/04/01at 9:25:31 PM
Center Frequency: 5.900000E+2
Logging stopped on: 09/04/01at 9:48:01 PM
Logging started on: 09/04/01at 9:51:17 PM
Center Frequency: 5.900000E+2
Logging stopped on: 09/04/01at 10:09:48 PM

Entry,Latitude,Longitude,Level
1,40.6991,-74.0724,37.200000
2,40.7015,-74.0669,45.600000
3,40.7030,-74.0680,40.850000
4,40.7021,-74.0709,50.150000
5,40.7024,-74.0758,45.850000
6,40.7024,-74.0763,34.350000
7,40.7042,-74.0752,29.400000
8,40.7055,-74.0742,27.350000
9,40.7059,-74.0738,31.500000
10,40.7061,-74.0736,29.700000
11,40.7090,-74.0720,30.250000
12,40.7116,-74.0693,31.200000
13,40.7126,-74.0686,25.850000
14,40.7129,-74.0684,25.900000
15,40.7135,-74.0679,25.950000
16,40.7142,-74.0675,21.000000
17,40.7153,-74.0668,22.500000
18,40.7151,-74.0674,18.800000
19,40.7158,-74.0688,27.700000
20,40.7165,-74.0705,22.100000
21,40.7167,-74.0711,23.100000
22,40.7169,-74.0717,19.400000
23,40.7174,-74.0727,20.300000
24,40.7179,-74.0740,23.250000
25,40.7184,-74.0751,22.850000
26,40.7184,-74.0753,21.550000
27,40.7189,-74.0765,21.050000
28,40.7189,-74.0765,3.550000
29,40.7192,-74.0770,0.600000
30,40.7193,-74.0774,0.850000
31,40.6728,-74.1741,16.850000
32,40.6758,-74.1717,15.500000
33,40.6805,-74.1684,13.650000
34,40.6855,-74.1650,15.000000
35,40.6904,-74.1616,16.650000
36,40.6952,-74.1581,16.150000
37,40.6998,-74.1547,13.100000
38,40.7046,-74.1517,15.050000
39,40.7053,-74.1485,19.800000
40,40.7049,-74.1474,16.200000
41,40.7045,-74.1464,17.600000
42,40.7039,-74.1451,16.400000
43,40.7035,-74.1443,19.100000
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45,40.7021,-74.1404,16.600000
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49,40.6995,-74.1323,22.900000
50,40.6989,-74.1304,20.850000
51,40.6979,-74.1271,23.150000
52,40.6974,-74.1252,23.400000
53,40.6970,-74.1239,24.300000
54,40.6962,-74.1212,4.100000
55,40.6952,-74.1180,21.600000
56,40.6947,-74.1166,26.050000
57,40.6944,-74.1154,23.000000
58,40.6935,-74.1125,27.250000
59,40.6933,-74.1120,27.250000
60,40.6931,-74.1111,27.050000
61,40.6925,-74.1093,27.450000
62,40.6920,-74.1076,18.650000
63,40.6913,-74.1055,24.100000
64,40.6908,-74.1040,23.400000
65,40.6901,-74.1028,22.050000
66,40.6873,-74.0992,23.050000
67,40.6860,-74.0936,24.900000
68,40.6881,-74.0882,28.150000
69,40.6918,-74.0840,25.650000
70,40.6960,-74.0795,30.200000
71,40.6986,-74.0740,34.200000
72,40.7006,-74.0690,40.350000
73,40.7041,-74.0651,43.350000
74,40.7062,-74.0616,37.550000
75,40.7084,-74.0578,33.700000
76,40.7117,-74.0543,28.400000
77,40.7163,-74.0557,30.300000
78,40.7209,-74.0551,27.400000
79,40.7258,-74.0533,28.950000
80,40.7305,-74.0511,27.900000
81,40.7306,-74.0463,23.850000
82,40.7305,-74.0449,18.450000
83,40.7305,-74.0449,17.550000
84,40.7305,-74.0449,19.000000
85,40.7303,-74.0444,18.250000
86,40.7302,-74.0442,0.750000
87,40.7302,-74.0442,0.750000
88,40.7303,-74.0437,13.550000
89,40.7304,-74.0432,18.550000
90,40.7312,-74.0429,19.650000
91,40.7313,-74.0428,18.650000
92,40.7319,-74.0436,16.700000
93,40.7319,-74.0440,18.700000
94,40.7320,-74.0457,16.600000
95,40.7316,-74.0482,21.200000
96,40.7314,-74.0491,20.450000
97,40.7313,-74.0497,22.800000
98,40.7312,-74.0503,20.100000
99,40.7313,-74.0517,23.950000
100,40.7316,-74.0522,12.000000
101,40.7324,-74.0534,0.500000
102,40.7388,-74.0612,9.800000
103,40.7393,-74.0633,20.550000
104,40.7391,-74.0682,15.450000
105,40.7385,-74.0739,18.400000
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107,40.7362,-74.0869,22.950000
108,40.7352,-74.0938,24.850000
109,40.7347,-74.1011,31.800000
110,40.7347,-74.1080,23.550000
111,40.7350,-74.1152,23.300000
112,40.7351,-74.1226,1.950000
113,40.7329,-74.1286,17.900000
114,40.7298,-74.1342,21.650000
115,40.7265,-74.1400,17.500000
116,40.7233,-74.1456,14.700000
117,40.7200,-74.1515,17.450000
118,40.7161,-74.1560,11.200000
119,40.7118,-74.1586,17.100000
120,40.7107,-74.1634,16.900000
121,40.7115,-74.1691,12.150000
122,40.7113,-74.1743,16.350000
123,40.7107,-74.1804,13.650000
124,40.7091,-74.1866,10.900000
125,40.7091,-74.1917,14.500000
126,40.7098,-74.1937,14.850000

09042.TXT Data

Logging started on: 09/05/01at 2:26:38 AM
Center Frequency: 1.610000E+3
Logging stopped on: 09/05/01at 3:49:29 AM
Logging started on: 09/05/01at 4:05:22 AM
Center Frequency: 1.610000E+3
Logging stopped on: 09/05/01at 4:17:36 AM

Entry,Latitude,Longitude,Level
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2,40.2568,-74.0796,8.500000
3,40.2613,-74.0789,5.500000
4,40.2658,-74.0778,5.150000
5,40.2705,-74.0781,4.550000
6,40.2753,-74.0799,5.000000
7,40.2798,-74.0827,4.150000
8,40.2845,-74.0862,2.600000
9,40.2891,-74.0893,2.600000
10,40.2942,-74.0908,3.000000
11,40.2997,-74.0919,2.600000
12,40.3051,-74.0930,2.500000
13,40.3102,-74.0947,0.750000
14,40.3156,-74.0966,1.900000
15,40.3209,-74.0978,1.250000
16,40.3265,-74.0979,1.350000
17,40.3320,-74.0981,2.150000
18,40.3372,-74.0999,2.600000
19,40.3414,-74.1033,1.600000
20,40.3441,-74.1091,1.850000
21,40.3471,-74.1145,2.700000
22,40.3515,-74.1178,1.350000
23,40.3551,-74.1227,2.100000
24,40.3575,-74.1288,2.050000
25,40.3603,-74.1343,2.000000
26,40.3641,-74.1390,0.950000
27,40.3686,-74.1423,0.700000
28,40.3729,-74.1451,3.450000
29,40.3769,-74.1488,1.850000
30,40.3798,-74.1549,1.900000
31,40.3821,-74.1607,2.450000
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33,40.3860,-74.1731,3.900000
34,40.3890,-74.1781,4.650000
35,40.3934,-74.1816,7.100000
36,40.3979,-74.1847,9.350000
37,40.4014,-74.1893,11.350000
38,40.4045,-74.1947,12.550000
39,40.4087,-74.1984,10.100000
40,40.4134,-74.2000,13.600000
41,40.4178,-74.2035,15.600000
42,40.4204,-74.2092,17.250000
43,40.4223,-74.2150,15.600000
44,40.4253,-74.2205,12.750000
45,40.4281,-74.2258,17.050000
46,40.4290,-74.2326,16.200000
47,40.4296,-74.2392,13.850000
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62,40.4850,-74.3023,20.000000
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87,40.6029,-74.3158,13.550000
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92,40.6258,-74.3052,9.100000
93,40.6261,-74.3043,6.500000
94,40.6275,-74.3043,8.200000
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96,40.6226,-74.3089,9.300000
97,40.6178,-74.3111,9.400000
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116,40.5282,-74.2984,33.050000
117,40.5231,-74.3004,28.150000
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120,40.5074,-74.3012,28.350000
121,40.5023,-74.3015,28.850000
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142,40.4268,-74.2254,11.050000
143,40.4241,-74.2193,13.400000
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174,40.4206,-74.0923,3.150000
175,40.4191,-74.0877,3.800000
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202,40.3836,-73.9748,4.750000
203,40.3800,-73.9746,2.600000
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206,40.3696,-73.9742,4.550000
207,40.3663,-73.9741,2.750000
208,40.3648,-73.9741,4.900000
209,40.3625,-73.9741,3.350000
210,40.3622,-73.9730,1.700000
211,40.3621,-73.9729,4.950000
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214,40.3625,-73.9739,2.550000
215,40.3625,-73.9739,1.950000
216,40.3609,-73.9742,1.250000
217,40.3578,-73.9738,5.100000
218,40.3540,-73.9738,2.200000
219,40.3498,-73.9738,3.950000
220,40.3455,-73.9740,3.200000
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223,40.3328,-73.9748,1.450000
224,40.3292,-73.9753,3.800000

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65,40.4975,-74.3003,23.700000
66,40.5027,-74.3012,20.300000
67,40.5077,-74.3009,26.500000
68,40.5131,-74.3006,27.050000
69,40.5184,-74.3009,29.050000
70,40.5234,-74.2997,27.150000
71,40.5285,-74.2980,27.400000
72,40.5334,-74.3001,30.950000
73,40.5371,-74.3047,34.400000
74,40.5414,-74.3087,34.800000
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144,40.4210,-74.2141,14.400000
145,40.4187,-74.2103,15.150000
146,40.4201,-74.2064,16.500000
147,40.4221,-74.2058,18.100000
148,40.4253,-74.2044,17.400000
149,40.4256,-74.2001,21.450000
150,40.4273,-74.1953,21.600000
151,40.4287,-74.1907,17.300000
152,40.4297,-74.1876,24.400000
153,40.4298,-74.1875,22.500000
154,40.4316,-74.1838,24.650000
155,40.4335,-74.1807,24.000000
156,40.4357,-74.1769,29.500000
157,40.4374,-74.1726,32.950000
158,40.4377,-74.1676,31.200000
159,40.4380,-74.1632,27.850000
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161,40.4385,-74.1522,17.600000
162,40.4382,-74.1466,21.650000
225,40.3254,-73.9763,4.000000
226,40.3212,-73.9780,3.450000
227,40.3180,-73.9796,3.400000
228,40.3138,-73.9802,2.550000
229,40.3095,-73.9806,5.750000
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232,40.2976,-73.9812,2.100000
233,40.2935,-73.9822,2.600000
234,40.2894,-73.9832,2.850000
235,40.2852,-73.9840,1.500000
236,40.2822,-73.9846,2.550000
237,40.2792,-73.9852,2.400000
238,40.2813,-73.9847,4.200000
239,40.2815,-73.9877,2.400000
240,40.2811,-73.9917,1.400000
241,40.2812,-73.9960,2.550000

09051.TXT Data

Logging started on: 09/05/01at 6:31:15 PM
Center Frequency: 1.610000E+3
Logging stopped on: 09/05/01at 6:47:02 PM
Logging started on: 09/05/01at 7:01:04 PM
Center Frequency: 1.610000E+3
Logging stopped on: 09/05/01at 8:02:39 PM

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5,40.1766,-74.5322,3.900000
6,40.1770,-74.5397,3.450000
7,40.1781,-74.5471,2.250000
8,40.1803,-74.5536,2.550000
9,40.1826,-74.5605,3.250000
10,40.1849,-74.5674,3.800000
11,40.1872,-74.5739,2.800000
12,40.1895,-74.5808,4.500000
13,40.1911,-74.5880,3.450000
14,40.1924,-74.5949,4.400000
15,40.1943,-74.6020,12.600000
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17,40.1984,-74.6157,5.450000
18,40.1999,-74.6230,1.600000
19,40.2014,-74.6302,2.250000
20,40.2028,-74.6375,4.150000
21,40.2034,-74.6445,5.000000
22,40.2022,-74.6519,4.700000
23,40.2003,-74.6587,3.650000
24,40.1984,-74.6657,8.100000
25,40.1967,-74.6722,6.850000
26,40.1949,-74.6786,7.100000
27,40.1921,-74.6849,7.250000
28,40.1884,-74.6906,7.550000
29,40.1855,-74.6965,9.750000
30,40.1858,-74.7039,10.100000
31,40.1849,-74.7108,10.750000
32,40.1840,-74.7181,12.650000
33,40.1840,-74.7236,10.450000
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35,40.1831,-74.7225,12.550000
36,40.1786,-74.7227,13.200000
37,40.1732,-74.7228,14.000000
38,40.1676,-74.7215,16.400000
39,40.1623,-74.7196,17.650000
67,40.0533,-74.8231,4.500000
68,40.0495,-74.8285,3.700000
69,40.0457,-74.8335,3.650000
70,40.0409,-74.8373,6.000000
71,40.0356,-74.8396,5.450000
72,40.0304,-74.8416,4.600000
73,40.0250,-74.8438,6.000000
74,40.0198,-74.8458,8.300000
75,40.0140,-74.8482,12.050000
76,40.0090,-74.8517,13.950000
77,40.0050,-74.8564,18.000000
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79,39.9971,-74.8665,19.150000
80,39.9939,-74.8728,22.350000
81,39.9915,-74.8791,27.000000
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83,39.9846,-74.8908,37.600000
84,39.9802,-74.8952,47.800000
85,39.9759,-74.9001,42.950000
86,39.9717,-74.9053,39.650000
87,39.9680,-74.9106,36.300000
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90,39.9547,-74.9246,28.650000
91,39.9506,-74.9297,25.000000
92,39.9469,-74.9355,24.900000
93,39.9440,-74.9417,24.250000
94,39.9418,-74.9486,22.450000
95,39.9398,-74.9552,20.700000
96,39.9370,-74.9622,17.450000
97,39.9336,-74.9679,17.750000
98,39.9303,-74.9720,15.750000
99,39.9260,-74.9759,15.400000
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101,39.9157,-74.9815,15.800000
102,39.9104,-74.9838,13.250000
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104,39.9000,-74.9892,13.050000
105,39.8953,-74.9936,12.800000
133,39.8611,-75.1442,15.950000
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136,39.8563,-75.1633,9.500000
137,39.8534,-75.1687,13.600000
138,39.8504,-75.1744,9.000000
139,39.8475,-75.1801,9.350000
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141,39.8415,-75.1911,7.800000
142,39.8387,-75.1970,4.800000
143,39.8364,-75.2028,6.550000
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145,39.8317,-75.2148,3.500000
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147,39.8262,-75.2275,3.900000
148,39.8230,-75.2336,4.250000
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151,39.8164,-75.2536,2.700000
152,39.8148,-75.2603,1.850000
153,39.8131,-75.2674,3.000000
154,39.8115,-75.2745,1.850000
155,39.8098,-75.2812,2.750000
156,39.8082,-75.2883,2.650000
157,39.8069,-75.2955,3.600000
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161,39.7965,-75.3196,2.700000
162,39.7937,-75.3256,3.400000
163,39.7898,-75.3311,1.900000
164,39.7850,-75.3348,2.950000
165,39.7801,-75.3381,3.850000
166,39.7758,-75.3428,4.900000
167,39.7720,-75.3478,8.050000
168,39.7680,-75.3532,6.400000
169,39.7639,-75.3585,7.100000
170,39.7601,-75.3635,10.000000
171,39.7561,-75.3687,11.000000

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41,40.1561,-74.7182,21.450000
42,40.1519,-74.7188,21.050000
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45,40.1359,-74.7159,22.050000
46,40.1303,-74.7157,31.800000
47,40.1248,-74.7173,32.700000
48,40.1200,-74.7205,30.500000
49,40.1159,-74.7254,25.950000
50,40.1125,-74.7312,22.750000
51,40.1090,-74.7364,20.150000
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53,40.1012,-74.7466,18.150000
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55,40.0914,-74.7539,18.100000
56,40.0868,-74.7575,15.900000
57,40.0827,-74.7624,11.700000
58,40.0794,-74.7683,12.000000
59,40.0766,-74.7743,11.900000
60,40.0734,-74.7804,9.400000
61,40.0703,-74.7864,6.450000
62,40.0672,-74.7923,7.700000
63,40.0645,-74.7986,6.000000
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65,40.0606,-74.8123,4.450000
66,40.0572,-74.8178,5.750000
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109,39.8788,-75.0122,12.800000
110,39.8747,-75.0172,15.150000
111,39.8721,-75.0234,15.200000
112,39.8713,-75.0303,16.950000
113,39.8723,-75.0371,19.550000
114,39.8745,-75.0437,17.650000
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117,39.8722,-75.0644,28.400000
118,39.8721,-75.0720,31.000000
119,39.8728,-75.0792,32.900000
120,39.8723,-75.0855,26.050000
121,39.8729,-75.0916,29.450000
122,39.8745,-75.0965,27.000000
123,39.8776,-75.1007,21.950000
124,39.8772,-75.1045,7.600000
125,39.8740,-75.1027,22.100000
126,39.8697,-75.1022,13.400000
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128,39.8637,-75.1106,27.200000
129,39.8612,-75.1166,25.850000
130,39.8594,-75.1230,21.200000
131,39.8590,-75.1299,21.850000
132,39.8600,-75.1366,18.600000
172,39.7522,-75.3740,11.950000
173,39.7485,-75.3792,11.150000
174,39.7451,-75.3851,13.400000
175,39.7418,-75.3907,12.650000
176,39.7384,-75.3966,12.450000
177,39.7349,-75.4024,13.350000
178,39.7315,-75.4083,14.650000
179,39.7281,-75.4138,17.400000
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181,39.7212,-75.4255,21.700000
182,39.7179,-75.4312,17.100000
183,39.7144,-75.4370,18.700000
184,39.7109,-75.4429,18.750000
185,39.7077,-75.4484,14.500000
186,39.7044,-75.4545,16.050000
187,39.7010,-75.4604,13.050000
188,39.6970,-75.4652,16.000000
189,39.6928,-75.4701,13.200000
190,39.6887,-75.4748,8.850000
191,39.6845,-75.4797,8.750000
192,39.6806,-75.4843,5.950000
193,39.6795,-75.4900,8.150000
194,39.6812,-75.4927,1.950000
195,39.6806,-75.4925,9.000000
196,39.6779,-75.4942,5.650000

09052.TXT Data

Logging started on: 09/05/01at 9:00:40 PM
Center Frequency: 8.300000E+2
Logging stopped on: 09/05/01at 9:16:27 PM

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4,39.6833,-75.4809,44.900000
5,39.6847,-75.4834,43.350000
6,39.6867,-75.4866,34.200000
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11,39.7014,-75.4752,34.850000
12,39.7049,-75.4715,29.350000
13,39.7090,-75.4703,34.150000
14,39.7127,-75.4706,16.650000
15,39.7165,-75.4709,9.900000
16,39.7193,-75.4694,14.150000
17,39.7222,-75.4666,21.500000
18,39.7253,-75.4646,17.000000
19,39.7256,-75.4644,14.050000
20,39.7278,-75.4629,12.350000
21,39.7309,-75.4608,10.250000
22,39.7345,-75.4591,14.900000
23,39.7384,-75.4572,14.400000
24,39.7422,-75.4554,13.750000
25,39.7458,-75.4531,15.200000
26,39.7489,-75.4494,7.500000
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32,39.7692,-75.4243,11.200000
33,39.7728,-75.4203,7.800000
34,39.7762,-75.4164,15.300000
35,39.7798,-75.4123,10.550000
36,39.7833,-75.4085,14.300000
37,39.7862,-75.4045,5.850000
38,39.7875,-75.3992,14.250000
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40,39.7903,-75.3878,13.500000

09053.TXT Data

Logging started on: 09/05/01at 9:17:23 PM
Center Frequency: 1.380000E+3
Logging stopped on: 09/05/01at 9:30:54 PM

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4,39.8015,-75.3544,43.800000
5,39.8027,-75.3491,37.250000
6,39.8028,-75.3428,38.450000
7,39.8028,-75.3361,36.750000
8,39.8028,-75.3292,33.800000
17,39.8122,-75.2704,27.650000
18,39.8137,-75.2637,27.250000
19,39.8154,-75.2566,27.250000
20,39.8171,-75.2496,25.150000
21,39.8190,-75.2429,24.450000
22,39.8215,-75.2362,23.550000
23,39.8245,-75.2302,24.350000
24,39.8276,-75.2241,26.300000
33,39.8538,-75.1675,21.550000
34,39.8571,-75.1614,21.900000
35,39.8598,-75.1553,21.200000
36,39.8610,-75.1478,21.400000
37,39.8604,-75.1404,19.900000
38,39.8591,-75.1332,16.550000
39,39.8588,-75.1261,13.750000
40,39.8600,-75.1189,16.550000

9,39.8030,-75.3228,34.800000
10,39.8034,-75.3157,33.600000
11,39.8036,-75.3106,34.250000
12,39.8052,-75.3046,30.250000
13,39.8063,-75.2977,29.700000
14,39.8074,-75.2907,30.150000
15,39.8089,-75.2841,28.550000
16,39.8105,-75.2772,29.300000
25,39.8303,-75.2176,21.550000
26,39.8328,-75.2113,21.900000
27,39.8356,-75.2044,24.600000
28,39.8380,-75.1980,22.700000
29,39.8411,-75.1914,22.850000
30,39.8442,-75.1855,24.200000
31,39.8475,-75.1795,22.100000
32,39.8506,-75.1736,17.800000
41,39.8626,-75.1123,16.250000
42,39.8651,-75.1064,17.450000
43,39.8667,-75.1028,18.400000
44,39.8696,-75.1016,17.000000
45,39.8749,-75.1023,17.050000
46,39.8806,-75.1030,18.250000
47,39.8860,-75.1040,15.150000
48,39.8916,-75.1058,15.200000

09054.TXT Data

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Center Frequency: 1.610000E+3
Logging stopped on: 09/05/01at 11:50:11 PM
Logging started on: 09/05/01at 11:51:04 PM
Center Frequency: 1.610000E+3
Logging stopped on: 09/06/01at 12:00:34 AM
Logging started on: 09/06/01at 12:06:54 AM
Center Frequency: 1.610000E+3
Logging stopped on: 09/06/01at 12:22:40 AM

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6,39.4583,-74.6305,1.050000
7,39.4531,-74.6277,1.100000
8,39.4488,-74.6235,1.100000
9,39.4454,-74.6177,1.400000
10,39.4429,-74.6110,1.500000
11,39.4408,-74.6046,1.450000
12,39.4386,-74.5978,2.650000
13,39.4363,-74.5911,2.150000
14,39.4327,-74.5858,1.850000
15,39.4282,-74.5815,2.150000
16,39.4245,-74.5763,3.450000
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18,39.4186,-74.5638,5.950000
19,39.4156,-74.5575,6.150000
20,39.4128,-74.5515,7.450000
21,39.4095,-74.5455,7.450000
22,39.4062,-74.5395,9.700000
23,39.4057,-74.5326,14.150000
24,39.4031,-74.5261,18.400000
25,39.3999,-74.5201,24.650000
26,39.3967,-74.5144,31.250000
27,39.3926,-74.5109,47.050000
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29,39.3859,-74.5050,41.050000
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71,39.3618,-74.4242,9.850000
72,39.3617,-74.4244,9.250000
73,39.3614,-74.4251,7.700000
74,39.3602,-74.4280,3.550000
75,39.3598,-74.4292,12.700000
76,39.3591,-74.4307,16.700000
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98,39.3407,-74.4732,8.300000
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104,39.3318,-74.4916,17.050000
105,39.3304,-74.4945,14.250000
106,39.3299,-74.4956,13.050000
107,39.3297,-74.4959,11.250000
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142,39.3434,-74.5244,16.500000
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144,39.3495,-74.5332,20.700000
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149,39.3563,-74.5424,19.900000
150,39.3563,-74.5424,20.000000
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157,39.3686,-74.5527,7.850000
158,39.3715,-74.5530,5.550000
159,39.3747,-74.5534,7.550000
160,39.3775,-74.5538,5.750000
161,39.3810,-74.5550,10.250000
162,39.3835,-74.5558,10.700000
163,39.3837,-74.5559,13.400000
164,39.3870,-74.5570,9.900000
165,39.3904,-74.5581,12.050000
166,39.3910,-74.5583,11.750000
167,39.3929,-74.5590,13.800000
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51,39.3654,-74.4199,14.500000
52,39.3662,-74.4182,10.350000
53,39.3663,-74.4179,5.850000
54,39.3672,-74.4156,9.250000
55,39.3658,-74.4146,10.250000
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57,39.3647,-74.4135,2.800000
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116,39.3213,-74.5155,10.300000
117,39.3223,-74.5141,14.700000
118,39.3234,-74.5121,10.000000
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121,39.3272,-74.5048,15.950000
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124,39.3315,-74.4963,15.750000
125,39.3316,-74.4963,14.400000
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127,39.3316,-74.4963,17.400000
128,39.3313,-74.4966,13.200000
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177,39.4045,-74.5563,5.150000
178,39.4081,-74.5559,10.000000
179,39.4129,-74.5535,8.700000
180,39.4177,-74.5502,7.700000
181,39.4226,-74.5466,14.500000
182,39.4275,-74.5429,12.250000
183,39.4325,-74.5404,9.450000
184,39.4381,-74.5392,9.250000
185,39.4434,-74.5390,10.800000
186,39.4484,-74.5381,7.600000
187,39.4534,-74.5354,5.100000
188,39.4586,-74.5337,6.100000
189,39.4634,-74.5315,3.100000
190,39.4681,-74.5293,3.450000
191,39.4709,-74.5282,3.900000

APPENDIX B

HAR COVERAGE MAPS

Appendix B contains the maps generated by ESRI ARCVIEW using collected data. Yellow colored dots represent samples where inadequate signal strength for intelligibility exists. Green shades indicate areas of questionable audio reception. Blue colors denote quality reception.

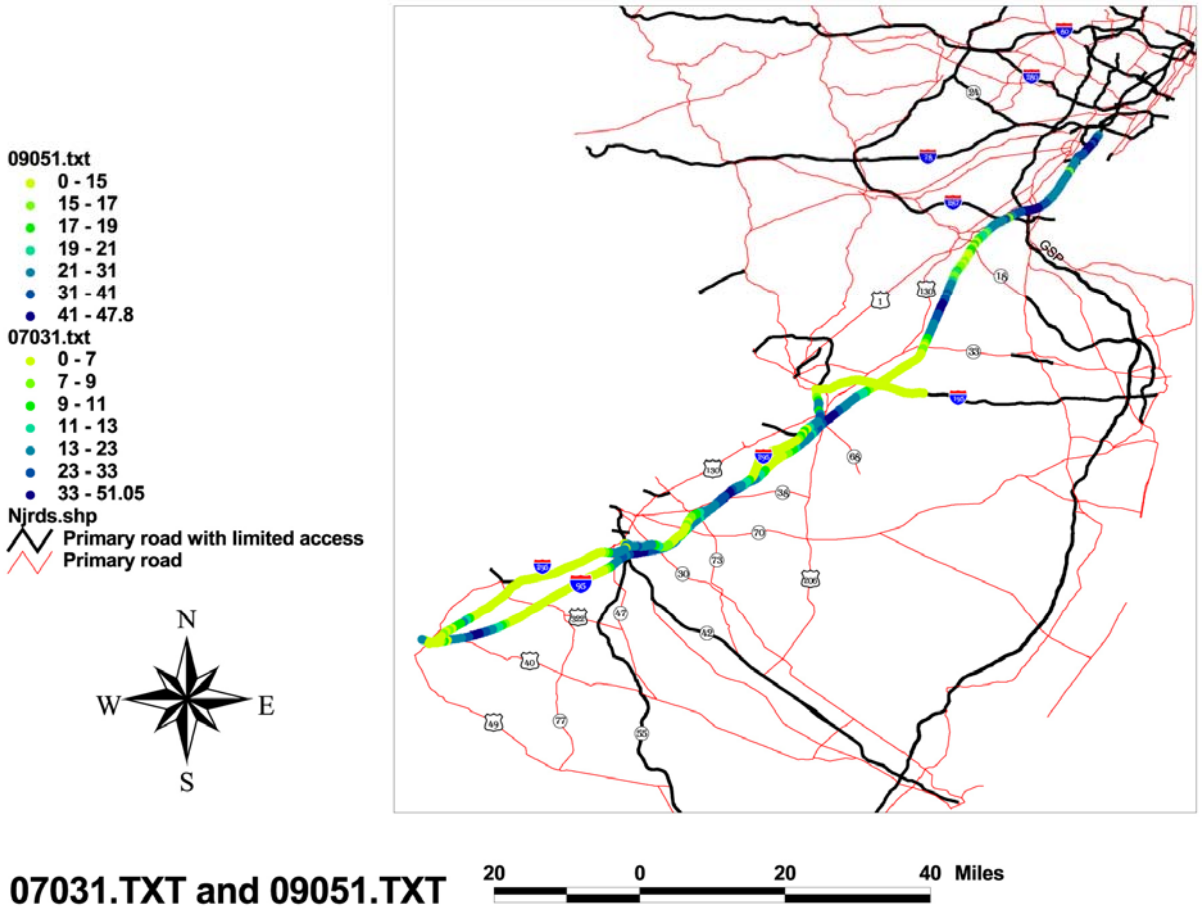

Figure B-1. Seven Transmitters on the New Jersey Turnpike

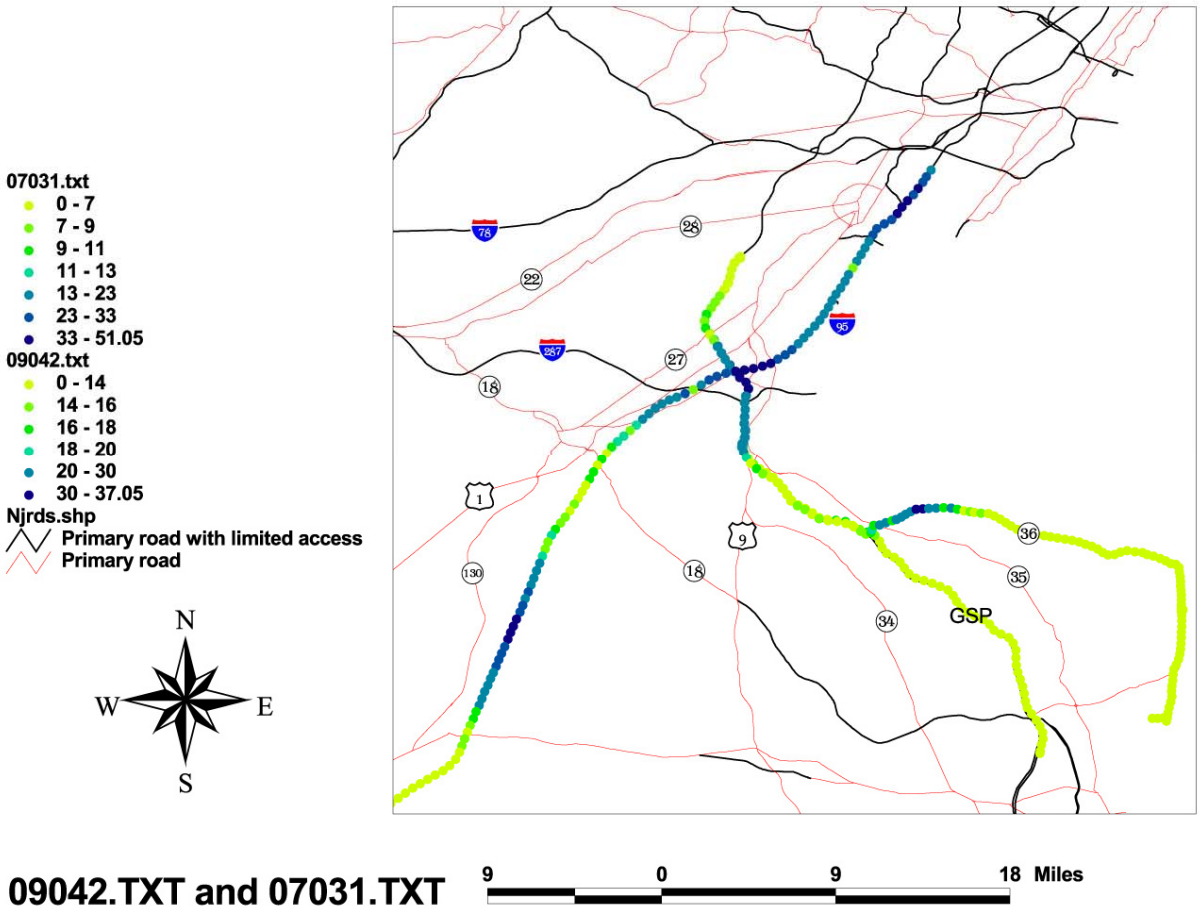

Figure B-2. New Jersey Turnpike Exit 11 and Ocean Beach on Route 36

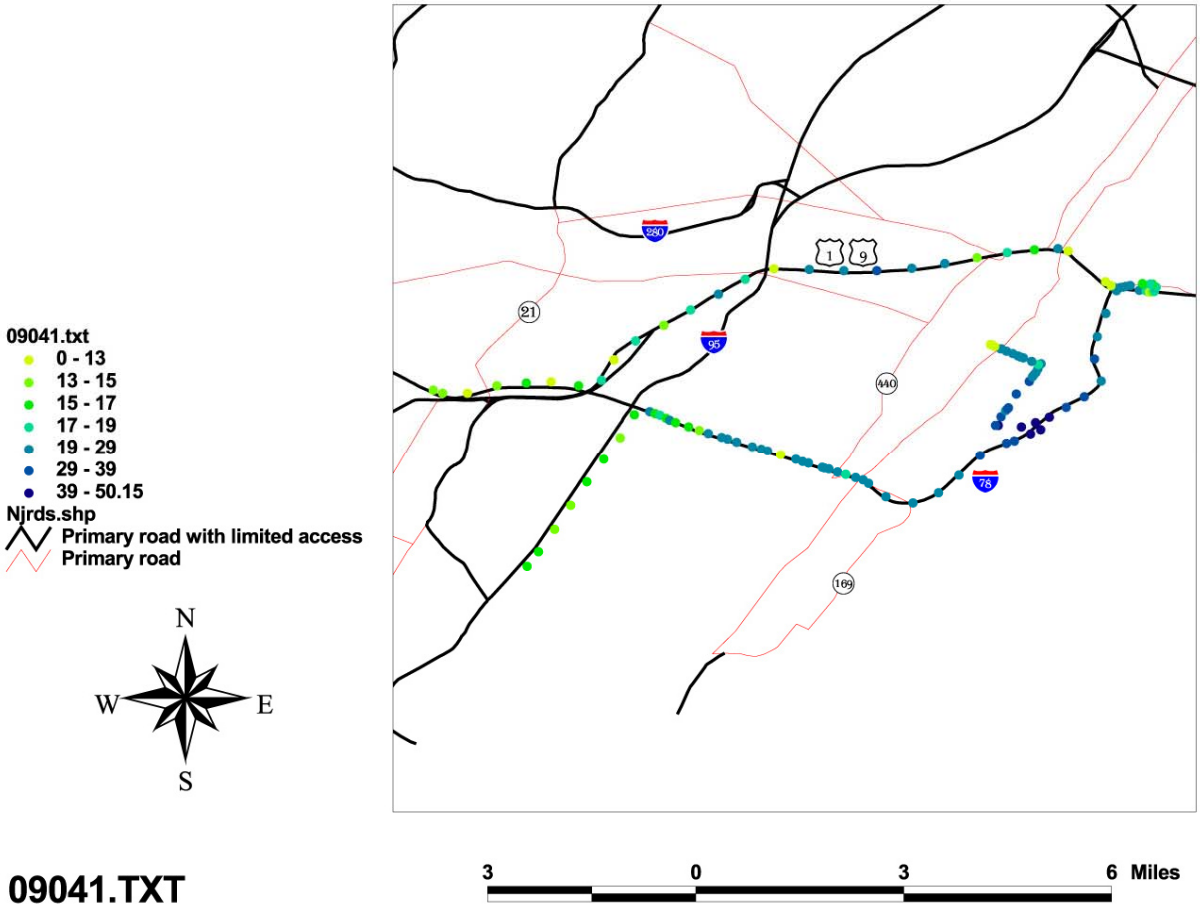

Figure B-3. New Jersey Turnpike Exit 14B

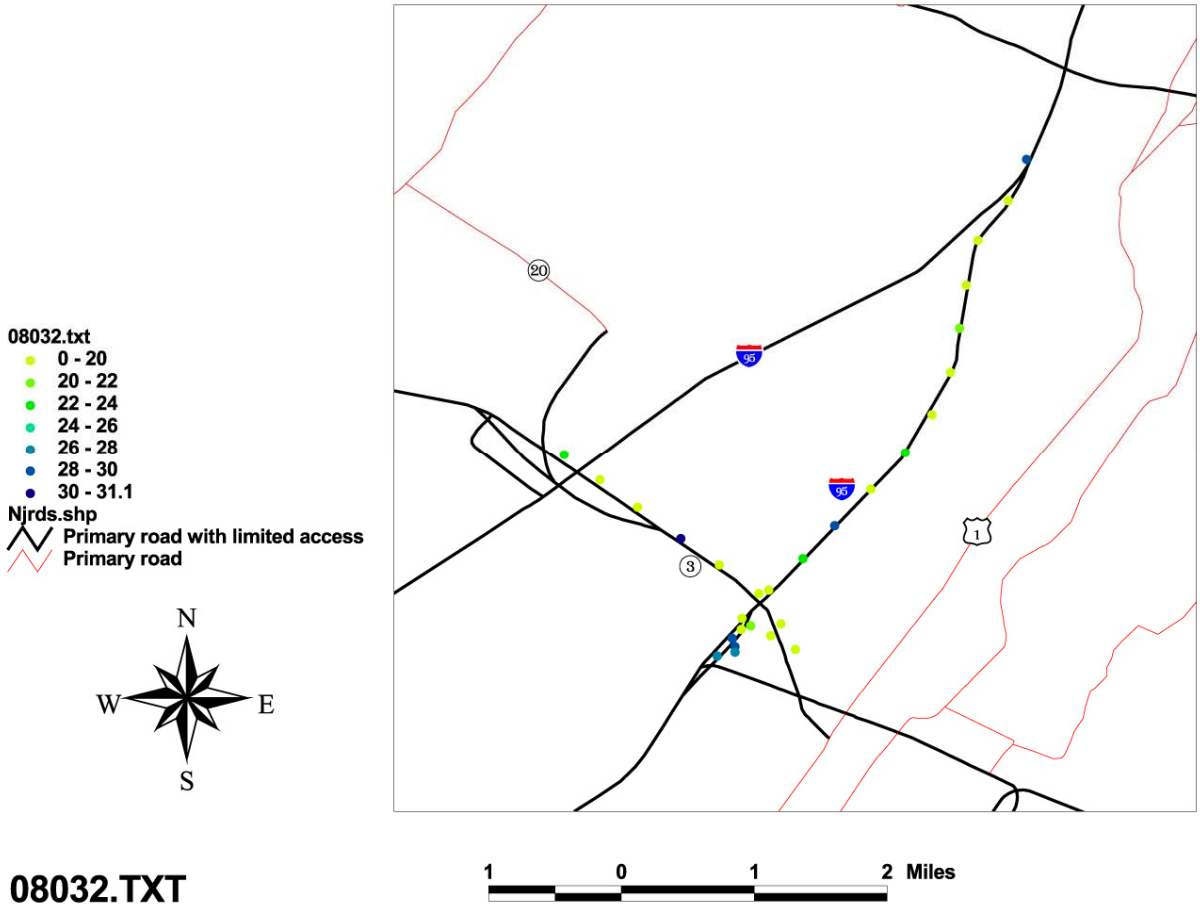

Figure B-4. New Jersey Turnpike Exit 16W

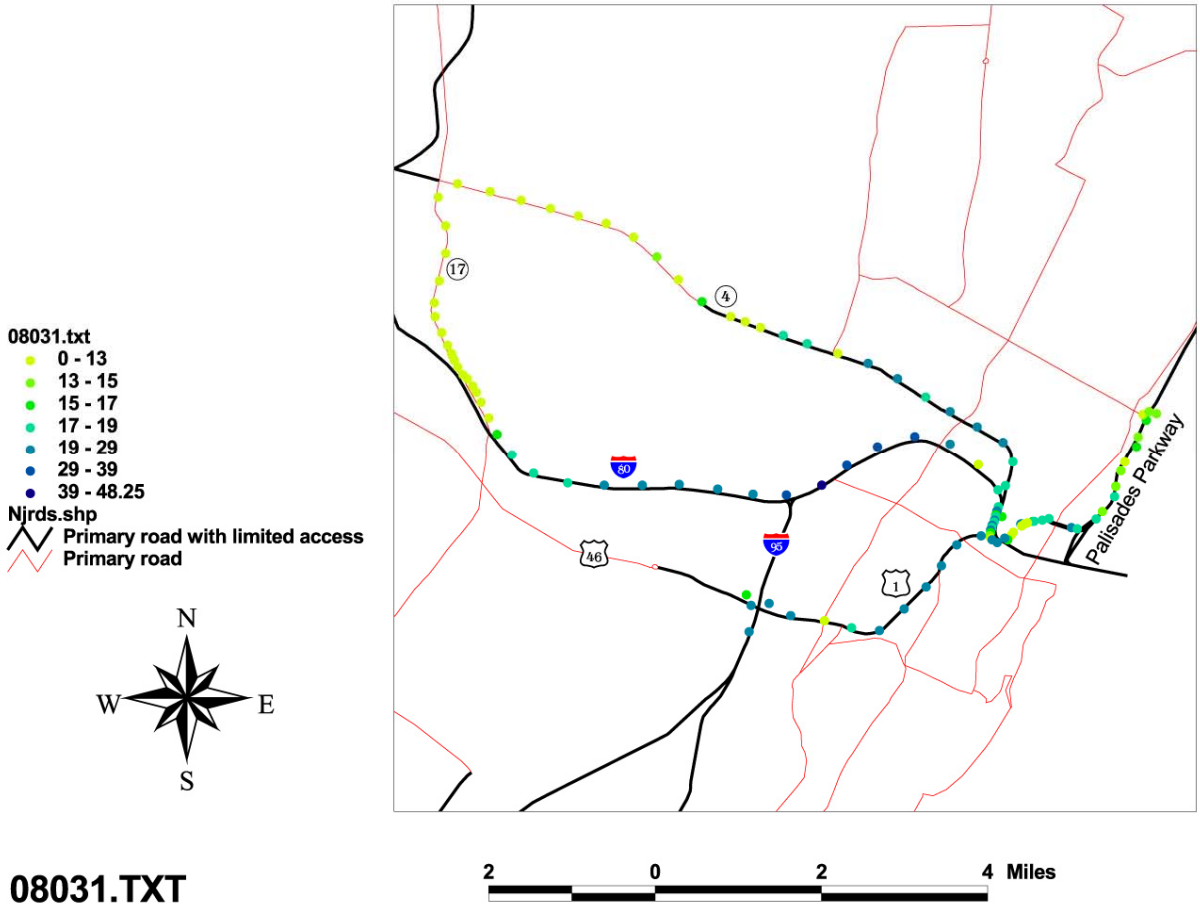

Figure B-5. I-95 and I-80 at George Washington Bridge

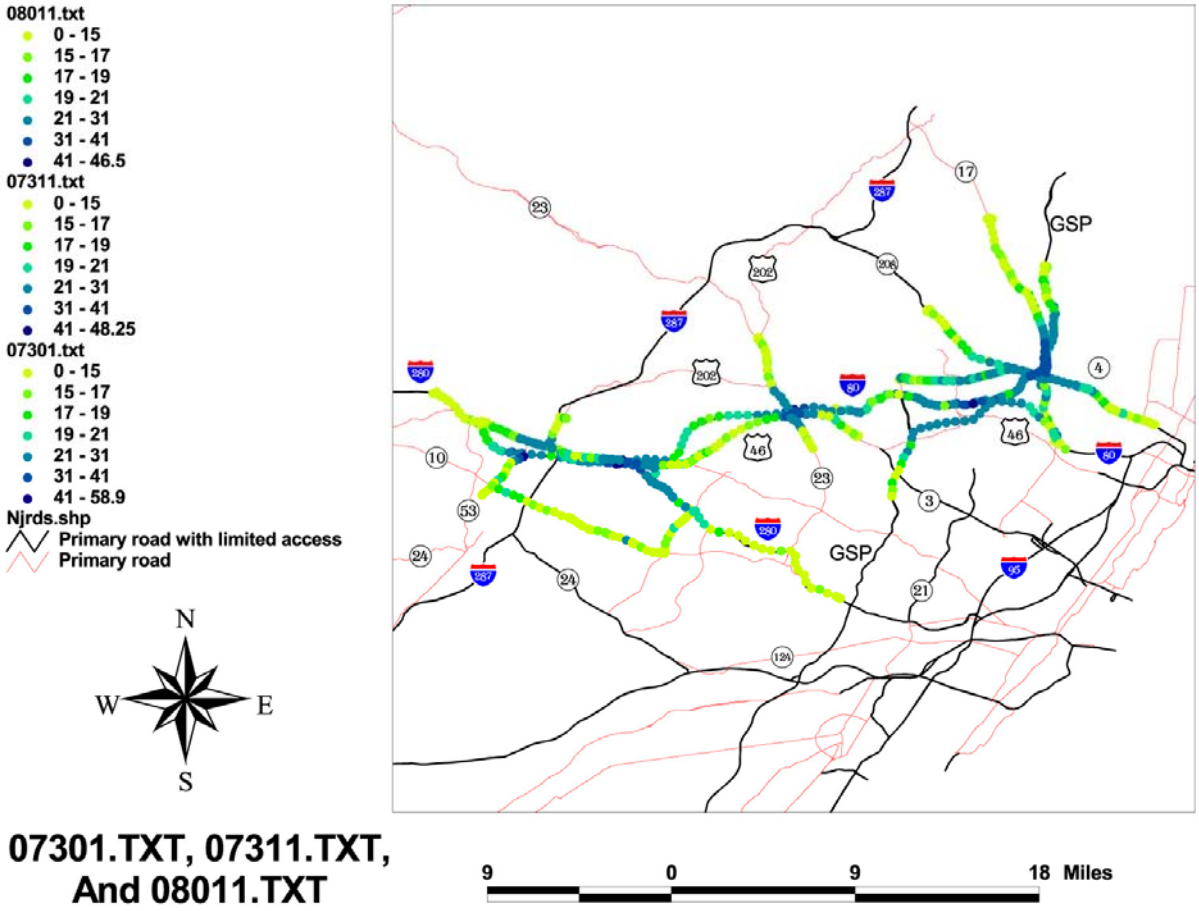

Figure B-6. MAGIC Transmitters Along I-80 Corridor

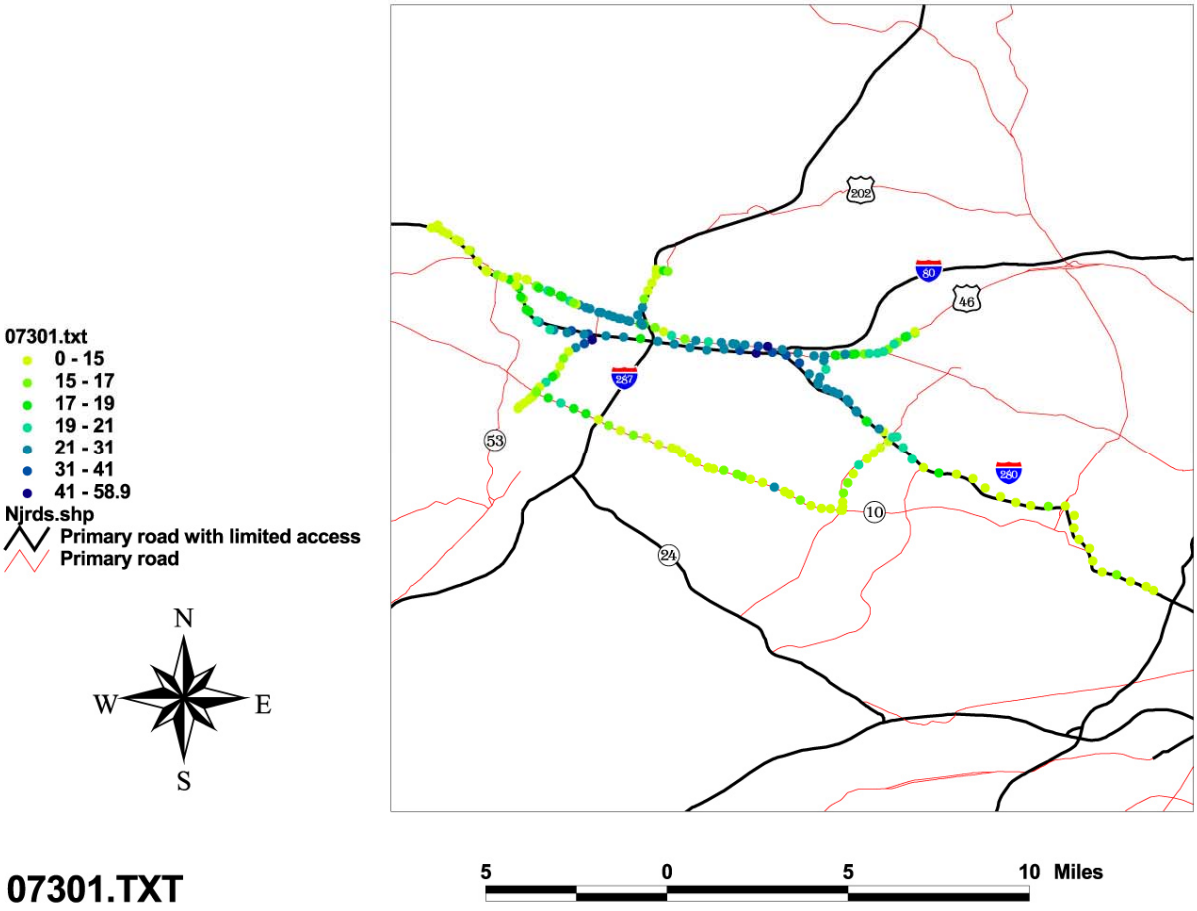

Figure B-7. I-80 at I-287

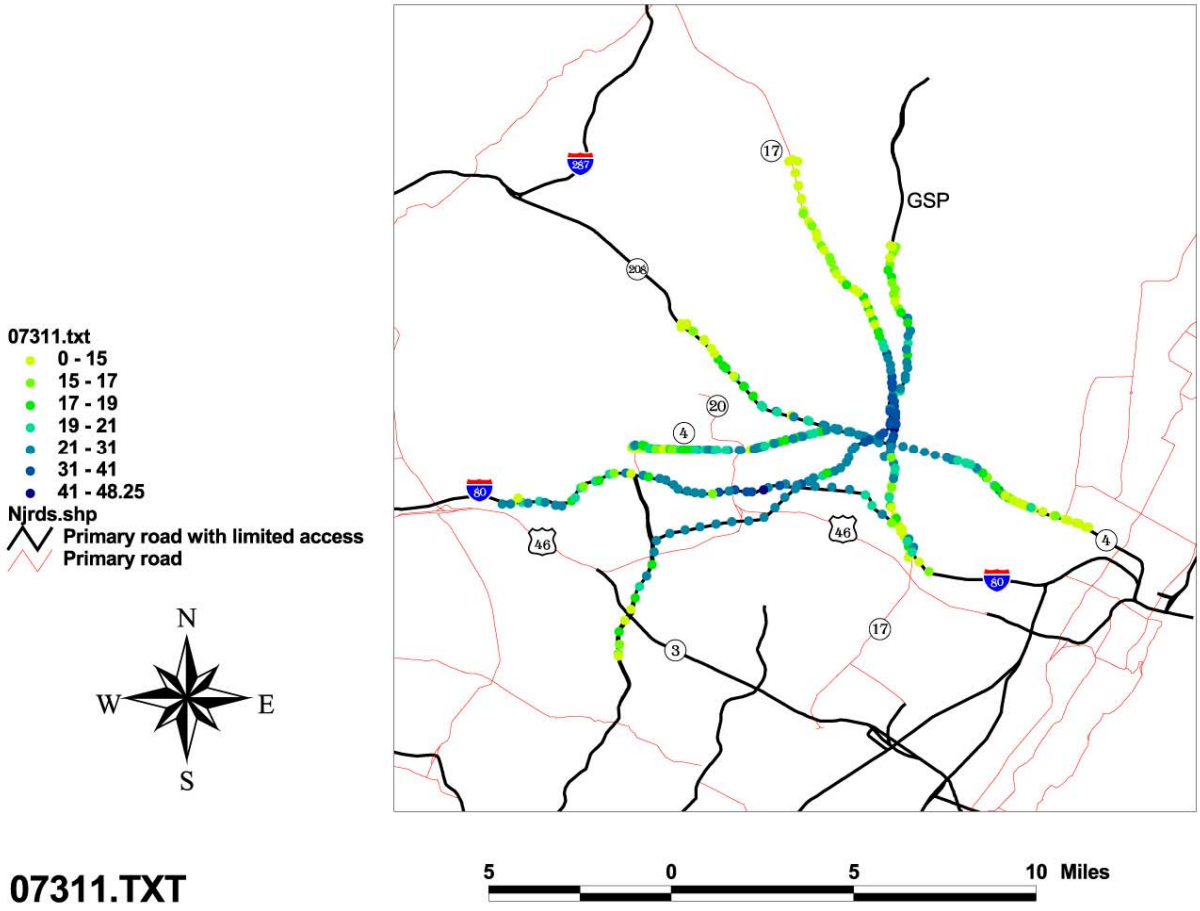

Figure B-8. NJ-4 at NJ-17

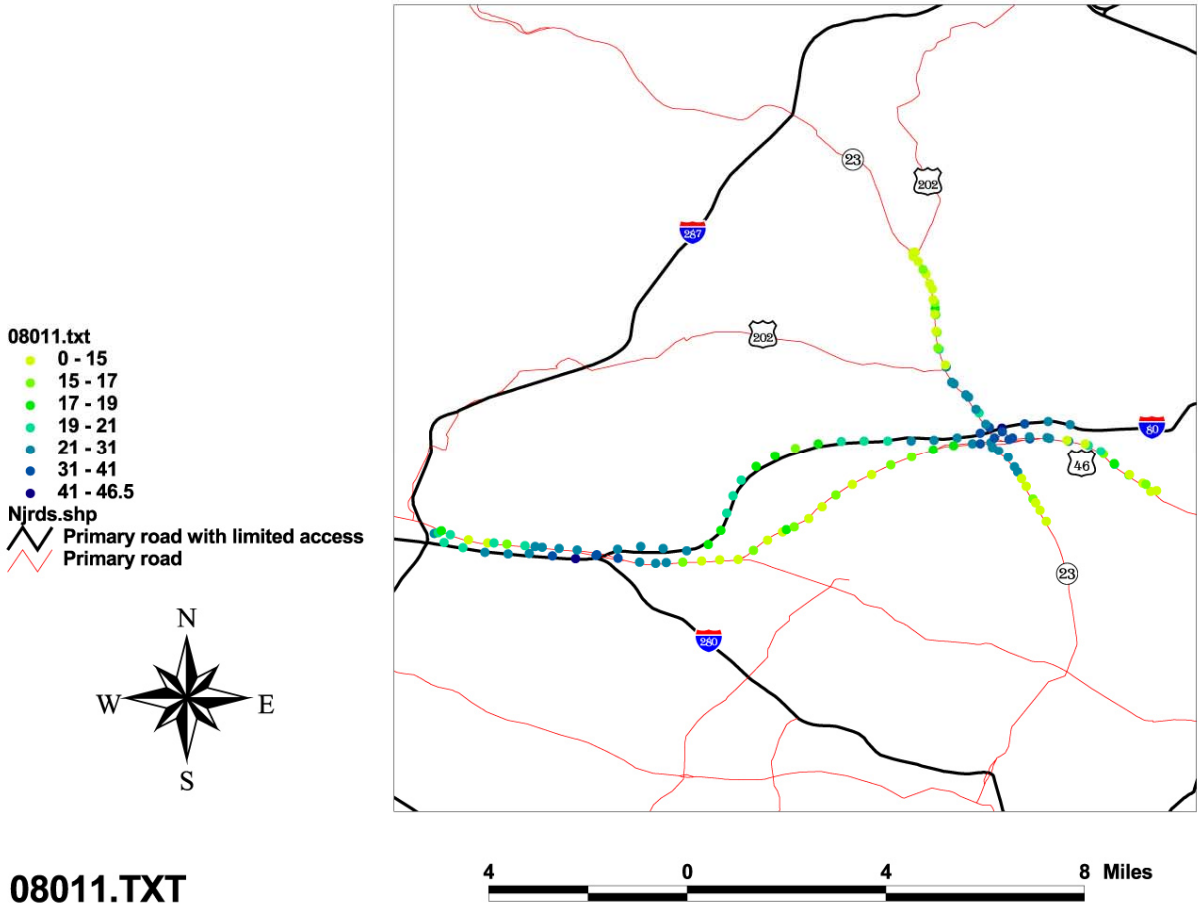

Figure B-9. Two Transmitters on I-80 at I-280 and NJ-23

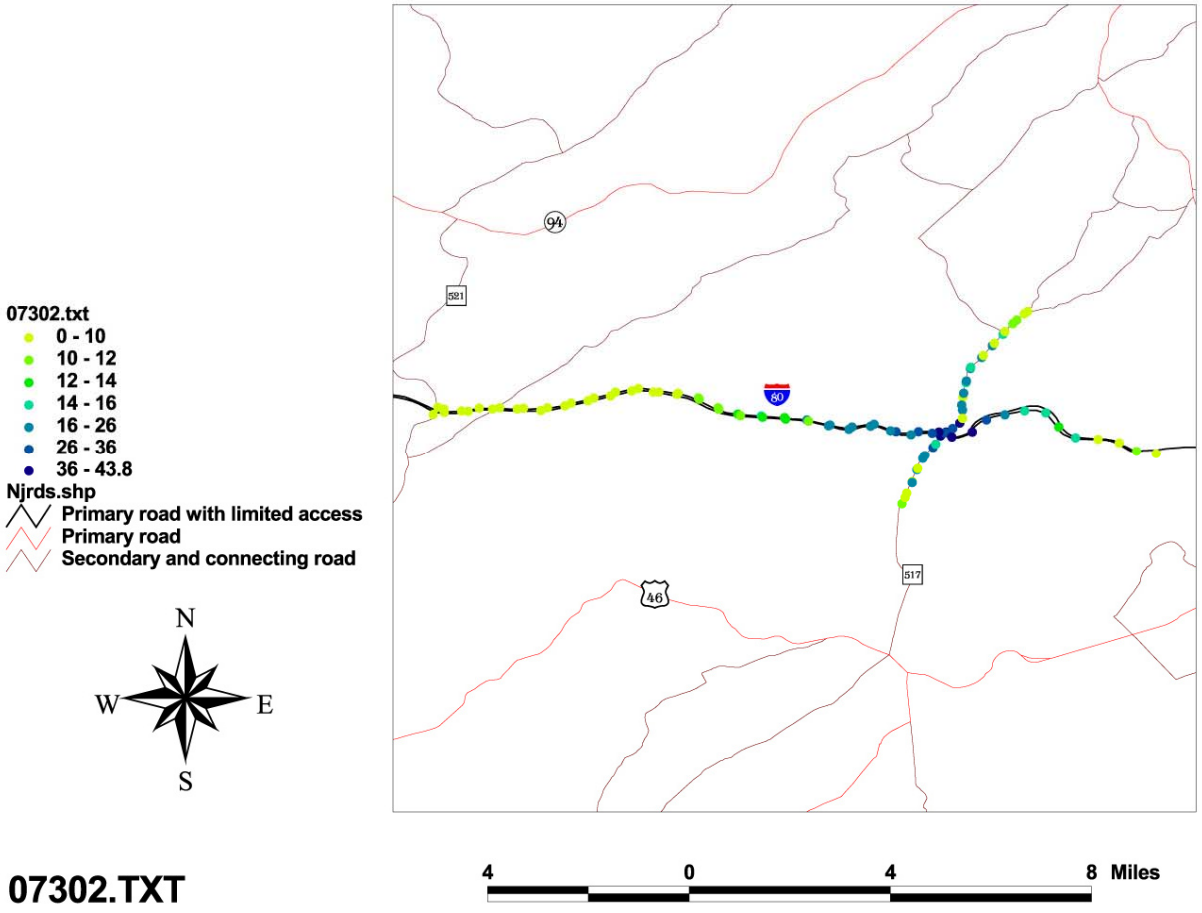

Figure B-10. I-80 at Allamuchy

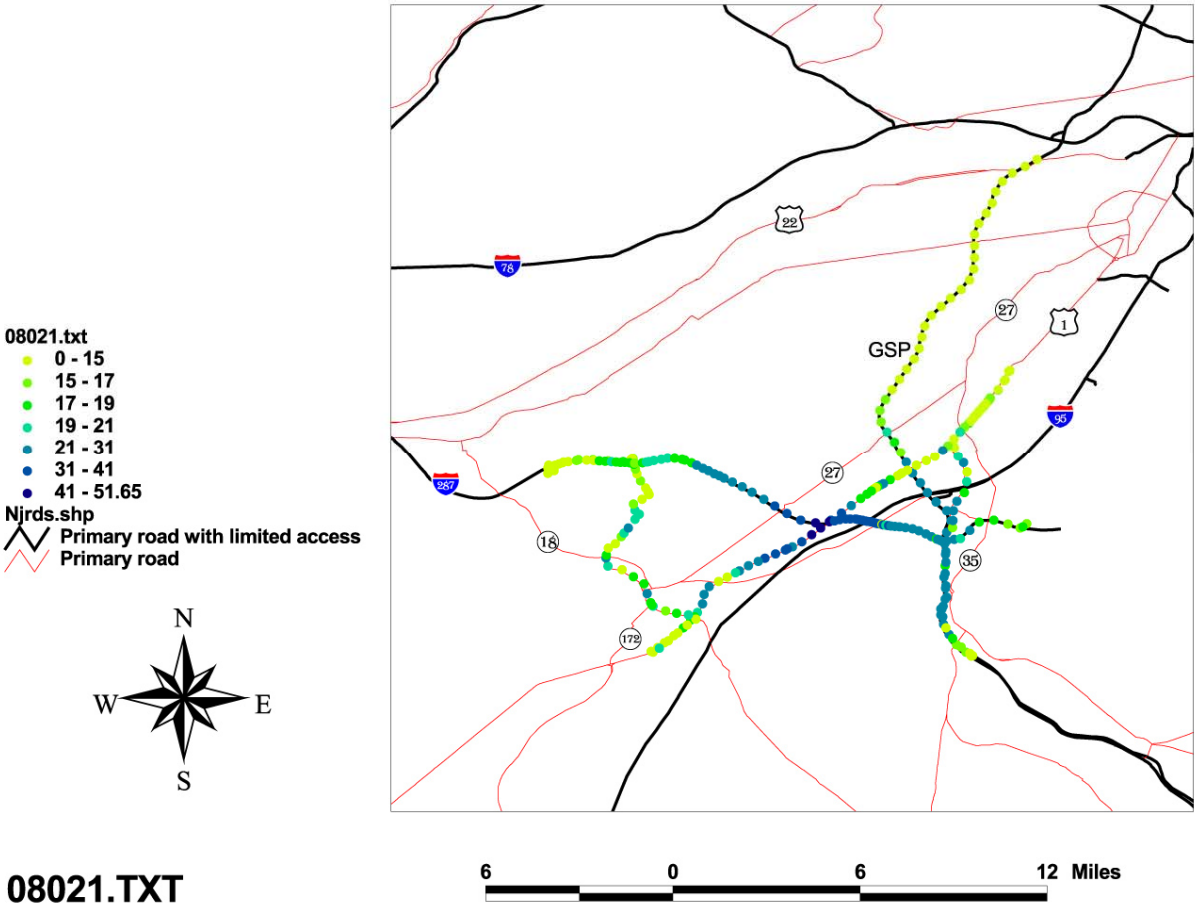

Figure B-11. US-1 at I-287

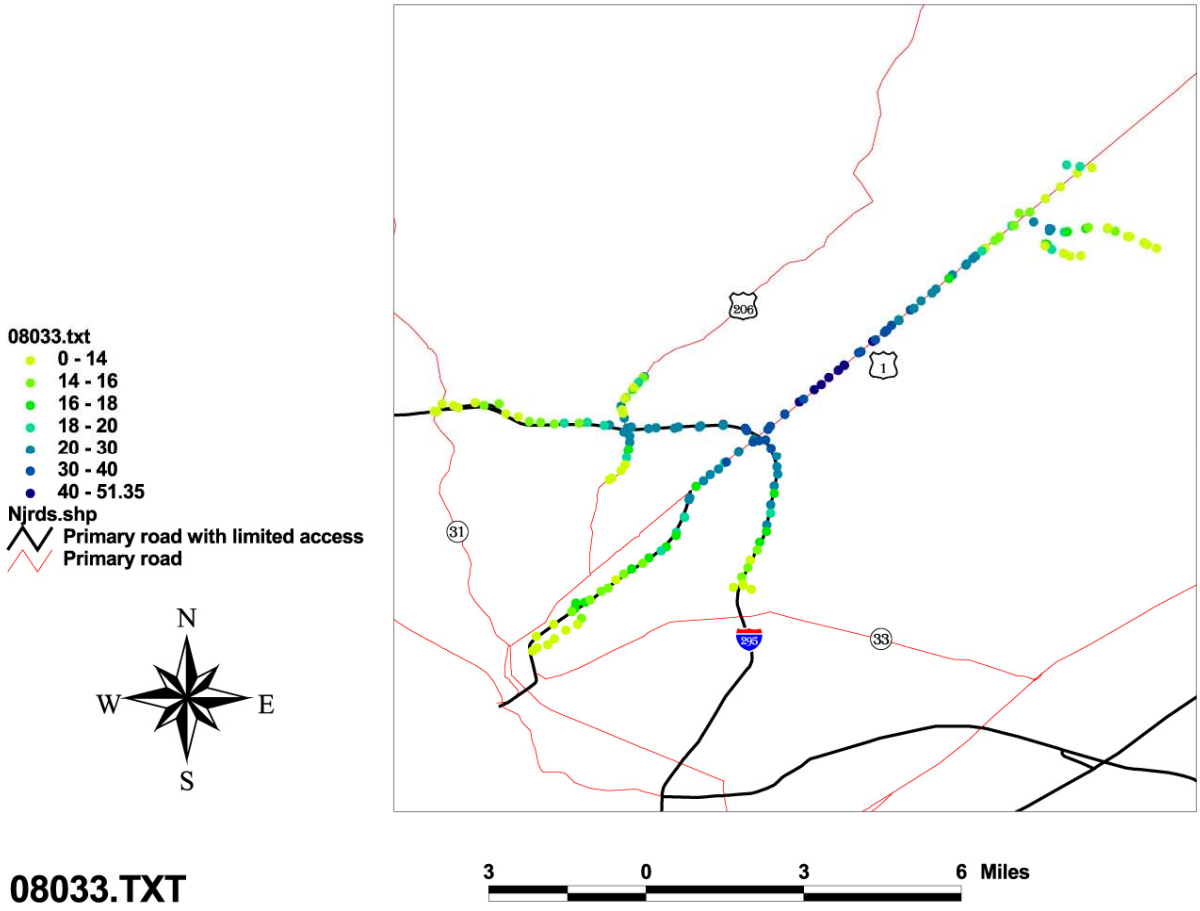

Figure B-12. US-1 at I-295

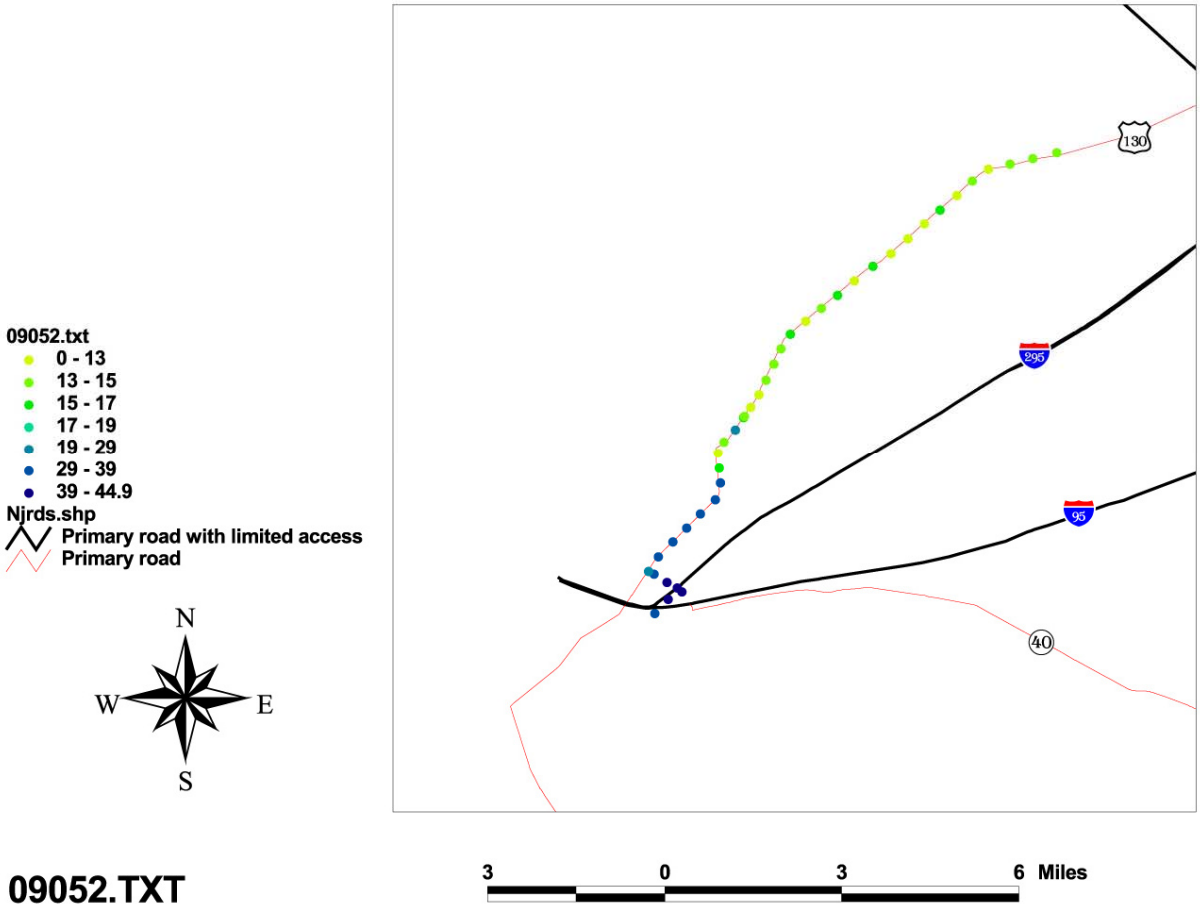

Figure B-13. Deepwater Transmitter Near Delaware Memorial Bridge

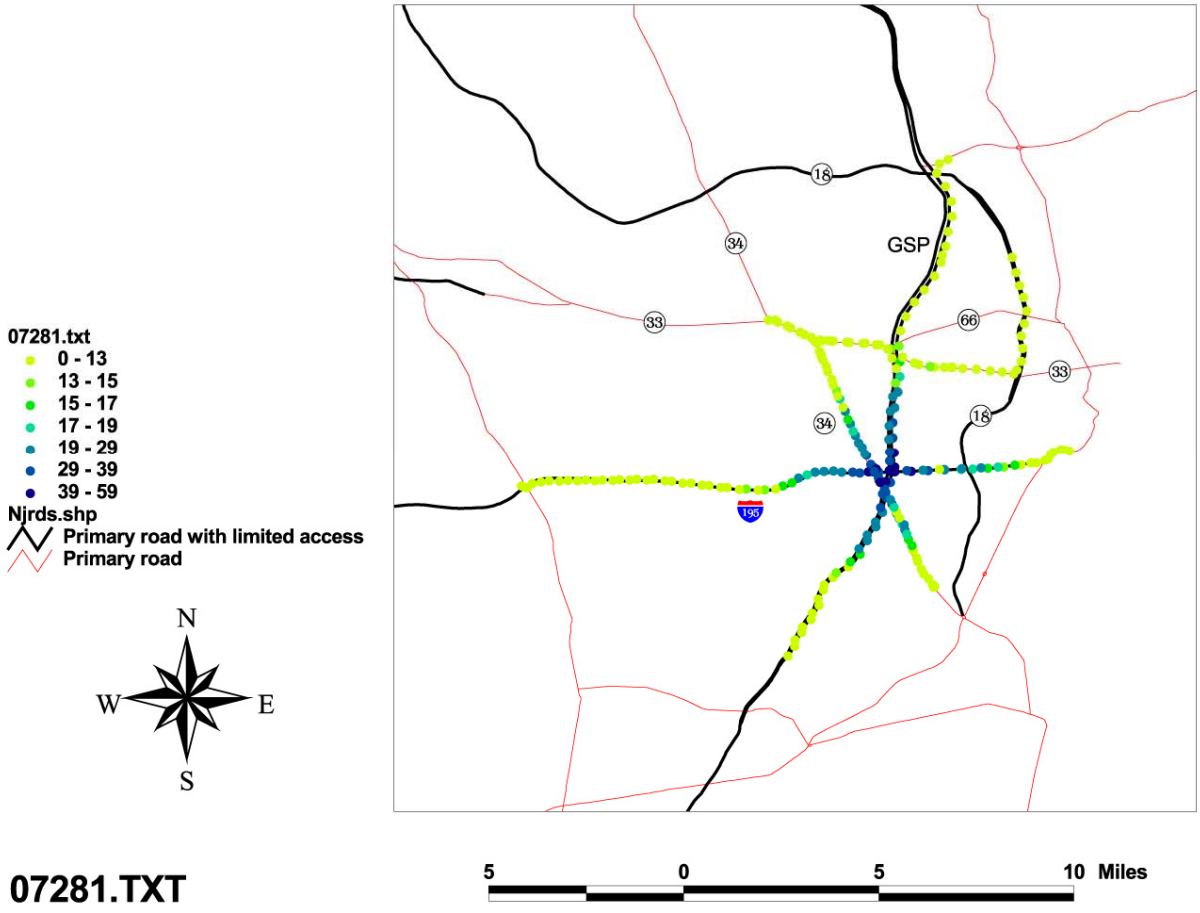

Figure B-14. Garden State Parkway Exit 98

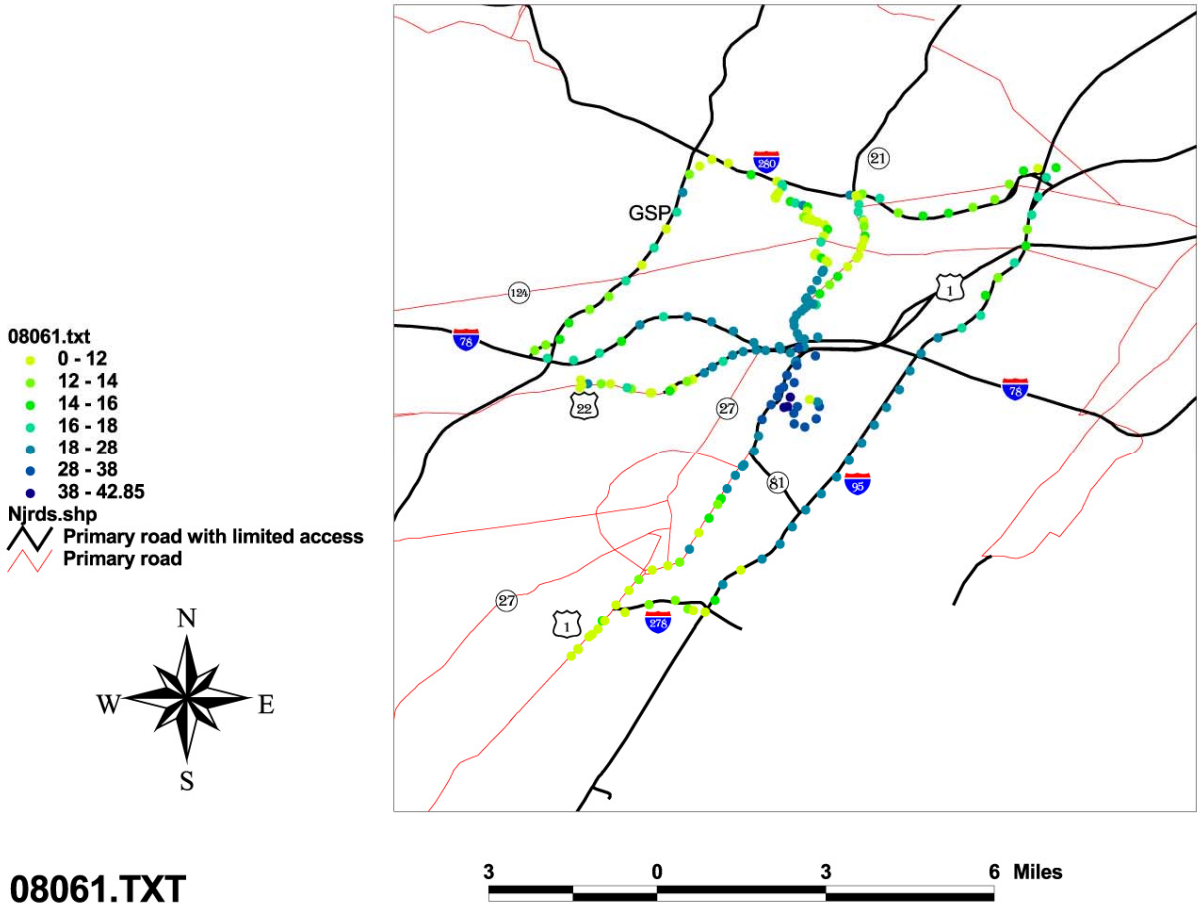

Figure B-15. Newark International Airport

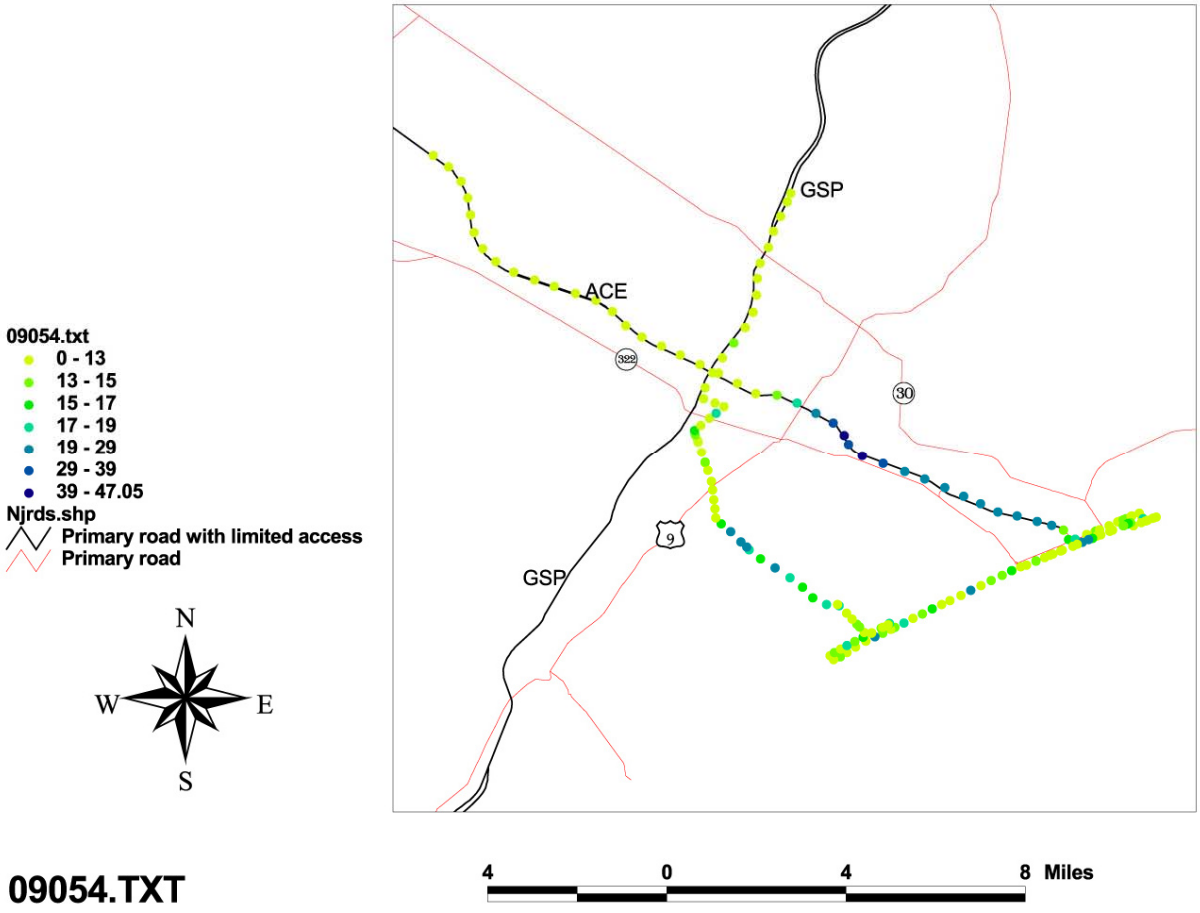

Figure B-16. Atlantic City Expressway at Pleasantville Toll Plaza

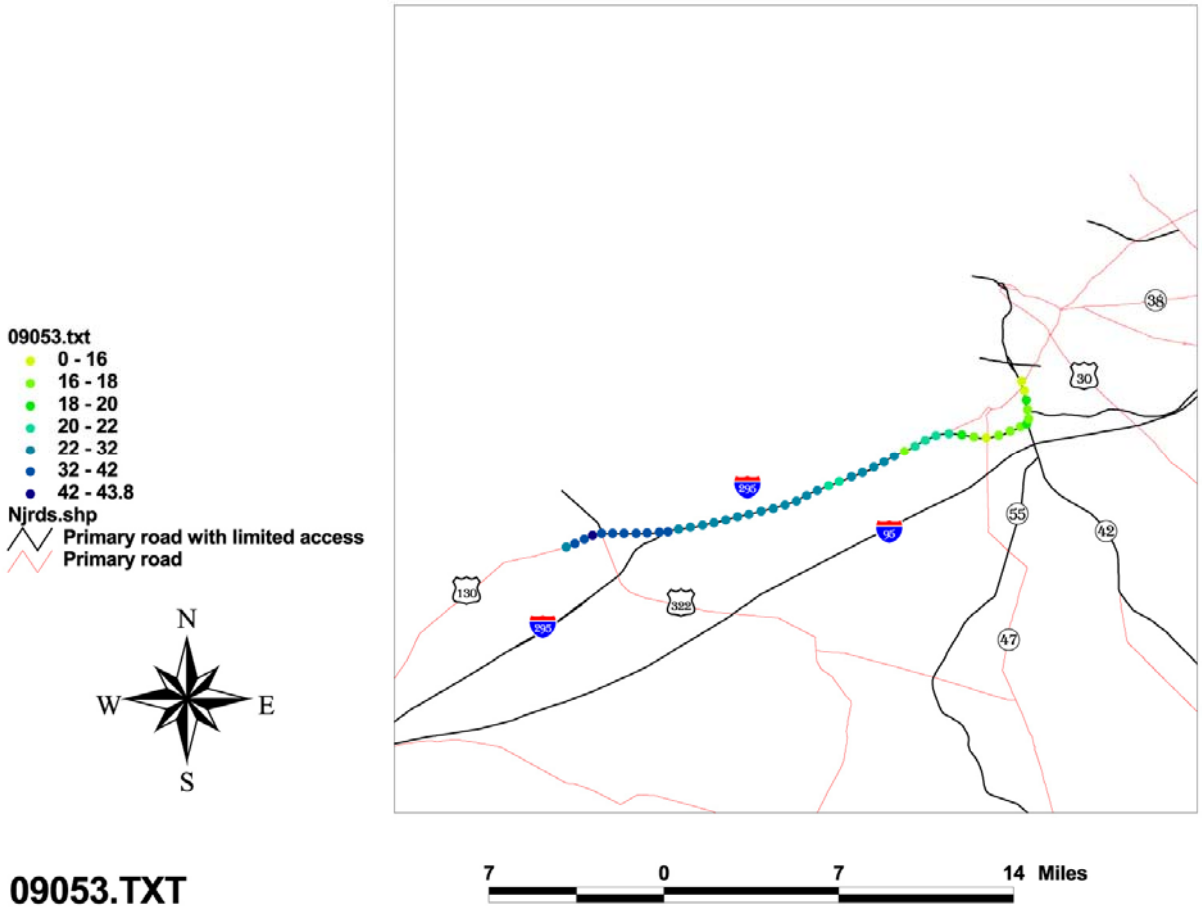

Figure B-17. Wilmington, DE Bleedover onto I-295