Table 5: Latency performance results – Stage I.

	Test Period Ending					
	30 May	06 June	13 June	20 June	27 June	Totals
Number of Calls	204	76	189	153	137	759
Average Latency (s)	1.48	1.16	1.4	1.42	2.26	1.56
67% Latency (s)	1.22	1.18	1.00	1.16	1.20	1.18

For completeness, location accuracy is reported as a function of the length of the total observation interval. As with most location systems, the RadioCamera™ system accuracy improves substantially as the observation period is increased. In this particular evaluation, the RadioCamera system estimates the subscriber location every 2.5 to 4 seconds. However, only one of these location estimates need be reported per observation interval. The system determines which location estimate to report based on a location quality or "confidence" measure. For Stage I testing, the quality factor was derived as a function of the signal strength and the ratio of the signal power to the background interference and noise power (SINR), as measured at each RadioCamera™ Base Unit.

In this analysis, the observation period was permitted to range from 1 fix period (approximately 3 seconds) up to 15 fix periods (approximately 45 seconds). This analysis was repeated for each of the four test environments (light urban, industrial, residential, suburban / rural) as well as the overall combined environments.

The number of calls and location fixes evaluated in Stage I is shown in Table 6, indicating the distribution of calls with respect to the four test environments.

Table 6: Number of calls and location fixes for each test environment – Stage I.

	Number of Calls		Number of Location Fixes	
Environment	Fixed	Mobile	Fixed	Mobile
Light Urban	85	29	722	839
Industrial	156	50	1296	1504
Residential	190	66	1617	1994
Suburban / Rural	37	29	319	951

The location accuracy performance as a function of observation interval length is shown in Figures 9 - 13. Each figure contains two graphs. The first represents the 67th percentile accuracy (in meters) as a function of the number of fixes per observation interval. The second graph indicates the percentage of fixes that exhibit an accuracy of 100 meters or better, again as a function of the number of fixes per observation interval. In each of these figures, the solid black curve represents the 67th percentile requirement as established by the FCC. The white curve is the performance that was achieved by the test system, using the quality factor to select the best measurement within each

observation period. For comparison, an additional gray curve is plotted indicating the performance that would be achieved had the best location estimate been selected from each observation period. That is, this performance indicates what could be achieved by the test system, provided the location quality estimator was able to optimally select the best estimate from each interval. As such, the gray curve should be viewed as a performance bound for the system indicating the type of performance that could be achieved as the location quality estimator improves and becomes more reliable.

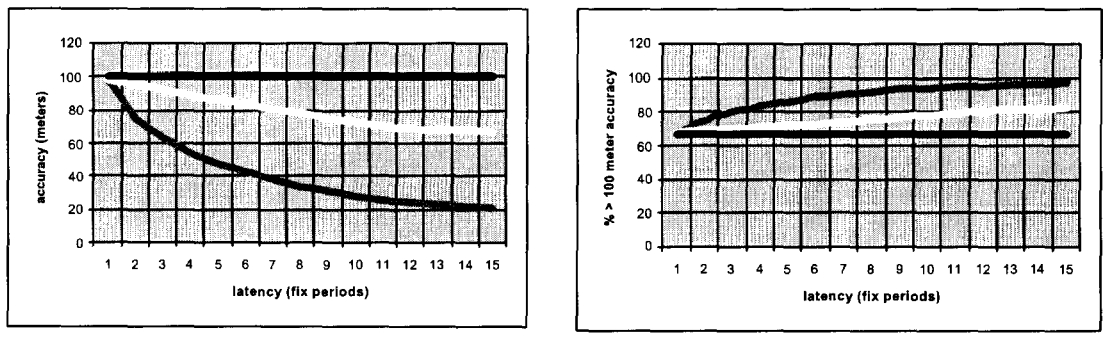


Figure 9: Combined environments, Stage I. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

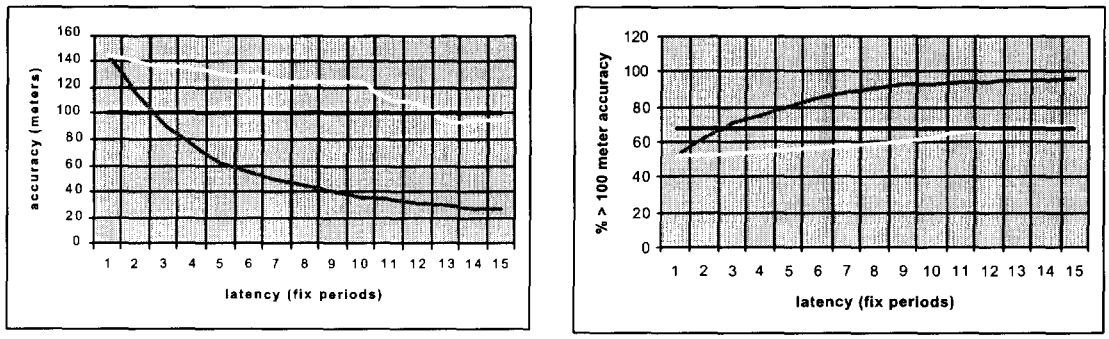


Figure 10: Light Urban environment, Stage I. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

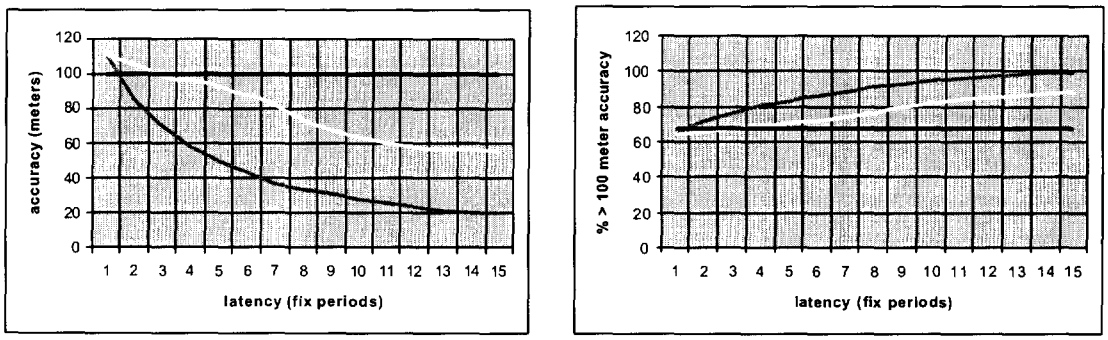


Figure 11: Industrial environment, Stage I. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

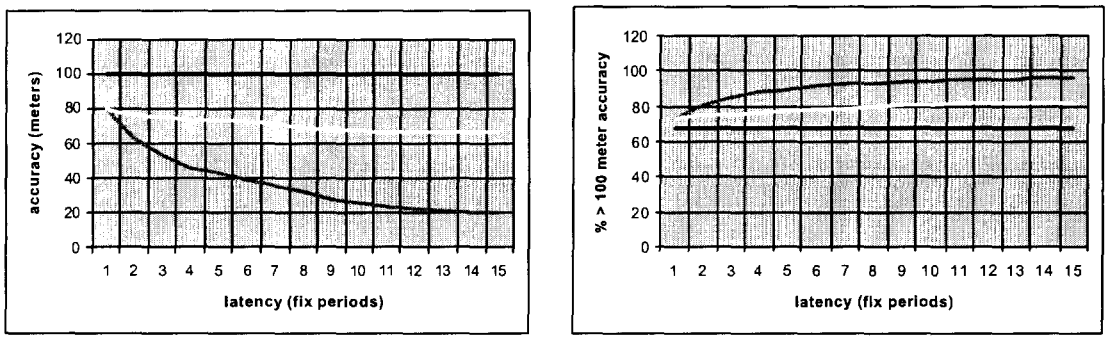


Figure 12: Residential environment, Stage I. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

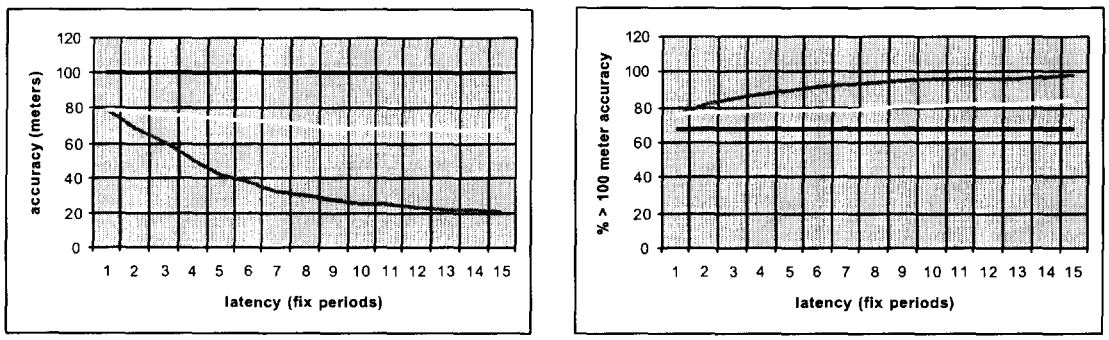


Figure 13: Suburban / Rural environment, Stage I. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

5.2 Stage II Results

Stage II latency analysis was conducted over the time period 08 July 99 through 21 July 99. The specific test periods used in this analysis are described in Table 7. Latency performance is characterized in terms of the average and 67th percentile performance and is summarized in Table 8 for each test period, as well as the overall performance for the entire stage of testing.

Table 7: Test periods for latency analysis – Stage II.

Date	Start Time	End Time
8-Jul-99	12:17	16:24
8-Jul-99	18:55	21:14
9-Jul-99	13:01	19:37
10-Jul-99	9:35	14:08
19-Jul-99	9:59	16:42
21-Jul-99	9:15	13:23

Table 8: Latency performance results – Stage II.

	Test Period Ending					
	08 July	09 July	10 July	19 July	21 July	Totals
Number of Calls	157	91	107	173	61	589
Average Latency (s)	1.25	1.77	1.55	2.10	1.40	1.65
67% Latency (s)	1.16	1.18	1.2	1.36	1.38	1.29

The number of calls and location fixes evaluated in Stage II is shown in Table 9, indicating the distribution of calls with respect to the four test environments.

Table 9: Number of calls and location fixes for each test environment – Stage II.

	Number of Calls		Number of Location Fixes	
Environment	**Fixed**	**Mobile**	**Fixed**	**Mobile**
Light Urban	84	30	781	872
Industrial	112	52	1052	1524
Residential	134	64	1208	2067
Suburban / Rural	77	33	696	923

The location accuracy performance as a function of observation interval length is shown in Figures 14 - 18. As before, each figure contains two graphs: the first representing the 67th percentile accuracy (in meters) as a function of the number of fixes per observation interval, and the second indicating the percentage of fixes that exhibit an accuracy of 100 meters or better. For Stage II testing, the location quality estimator was modified. The new estimator was determined as a function of the number of RadioCamera Base Units contributing to the location estimate and the signal power observed at each of the contributing sites.

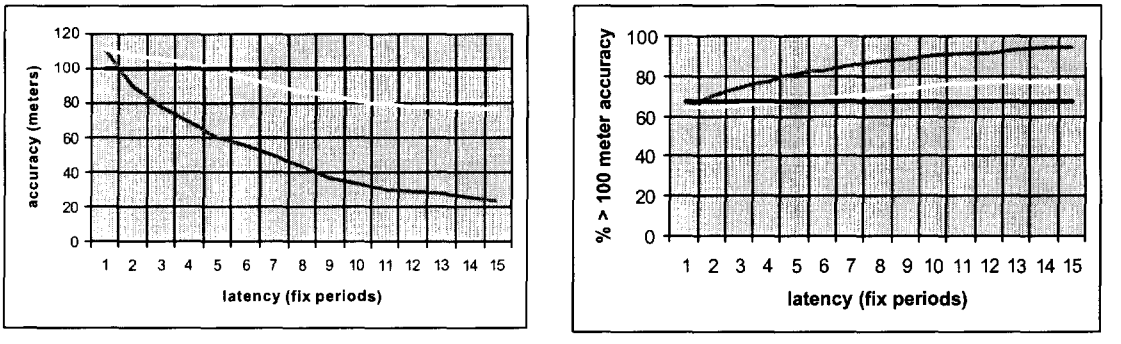


Figure 14: Combined environments, Stage II. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

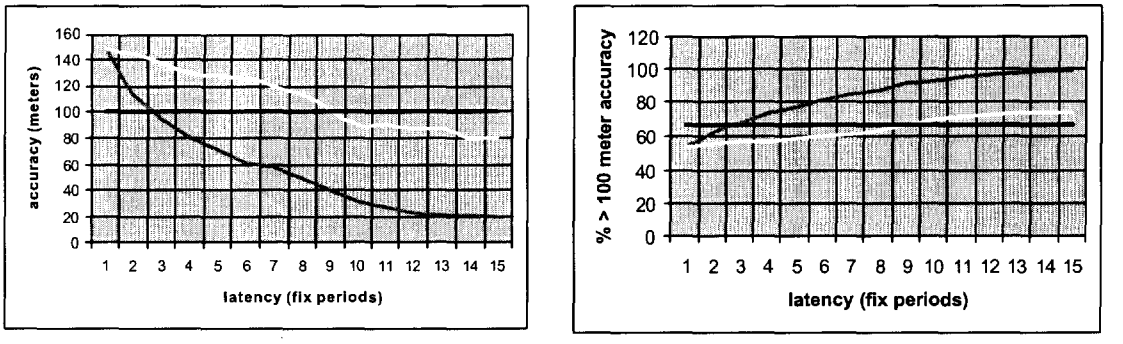


Figure 15: Light Urban environment, Stage II. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

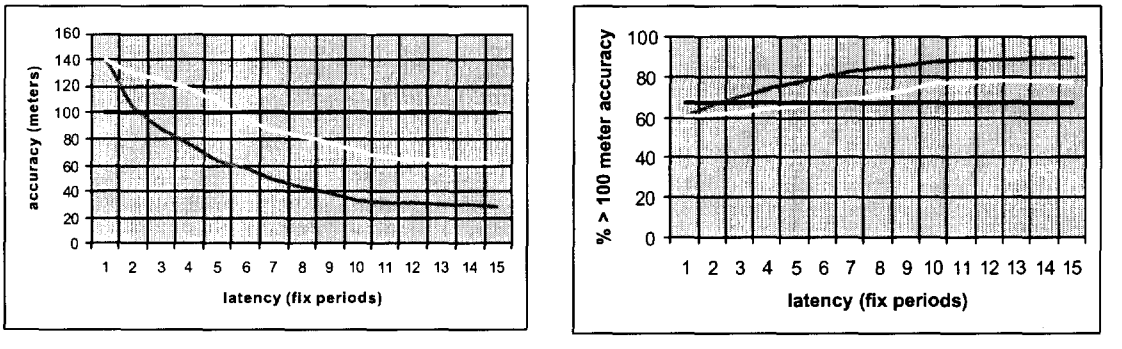


Figure 16: Industrial environment, Stage II. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

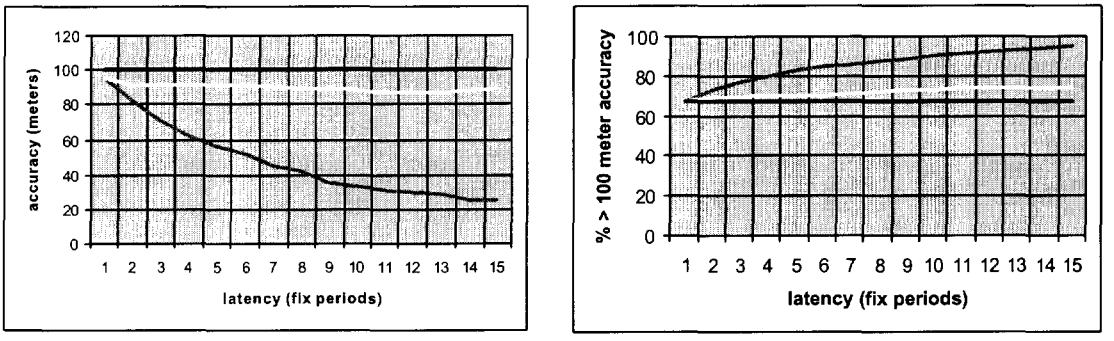


Figure 17: Residential environment, Stage II. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

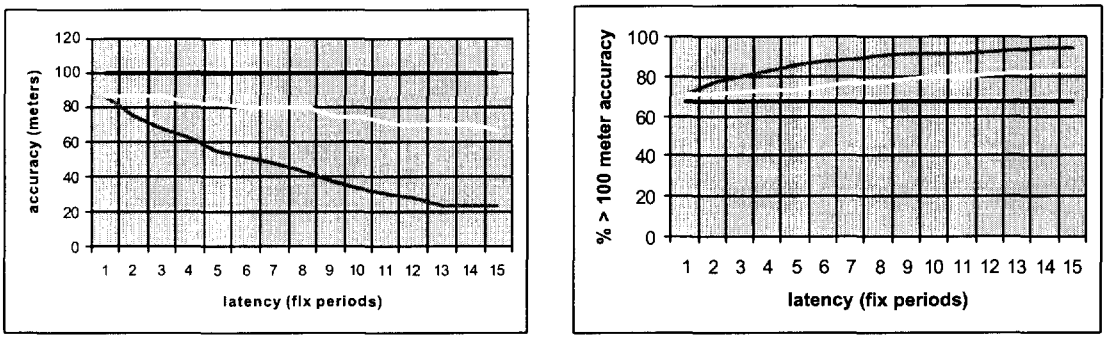


Figure 18: Suburban / Rural environment, Stage II. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

5.3 Stage III Results

Stage III latency analysis was conducted over the time period 12 August 99 through 25 August 99. The specific test periods used in this analysis are described in Table 10. Latency performance is characterized in terms of the average and 67th percentile performance, and is summarized in Table 11 for each test period, as well as the overall performance for the entire stage of testing.

Table 10: Test periods for latency analysis – Stage III.

Date	Begin Time	End Time
12-Aug-99	19:50	21:34
16-Aug-99	18:57	23:58
17-Aug-99	0:05	1:09
17-Aug-99	11:15	15:17
18-Aug-99	23:49	23:58
19-Aug-99	0:05	5:10
19-Aug-99	21:25	23:49
20-Aug-99	0:01	1:05
24-Aug-99	22:13	23:57
25-Aug-99	0:06	2:17
25-Aug-99	22:53	23:50
26-Aug-99	0:01	2:42
26-Aug-99	13:59	14:52

Table 11: Latency performance – Stage III.

	Test Period Ending			
	13 August	20 August	27 August	Totals
Number of Calls	36	370	207	613
Average Latency (s)	1.10	1.50	7.73	3.58
67% Latency (s)	1.12	1.13	15.2	1.14

The number of calls and location fixes evaluated in Stage III is shown in Table 12, indicating the distribution of calls with respect to the four test environments.

Table 12: Number of calls & location fixes for each test environment – Stage III.

	Number of Calls		Number of Location Fixes	
Environment	**Fixed**	**Mobile**	**Fixed**	**Mobile**
Light Urban	79	36	782	1471
Industrial	97	57	992	2095
Residential	110	77	1117	2613
Suburban / Rural	72	44	740	1792

The location accuracy performance as a function of observation interval length is shown in Figures 19 - 23. For Stage III testing, the location quality estimator was again modified to incorporate an improved measure of signal quality based on noise floor estimates, signal power, and interference levels.

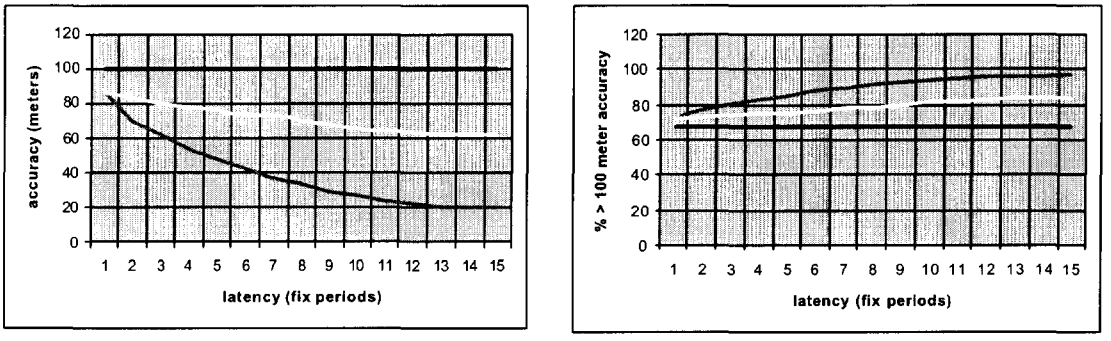
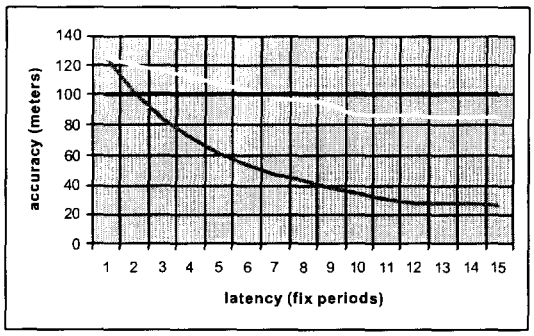


Figure 19: Combined environments, Stage III. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.



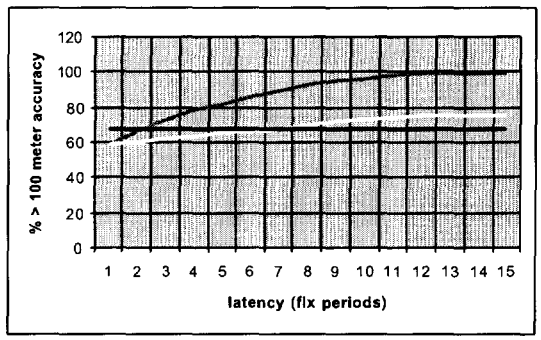
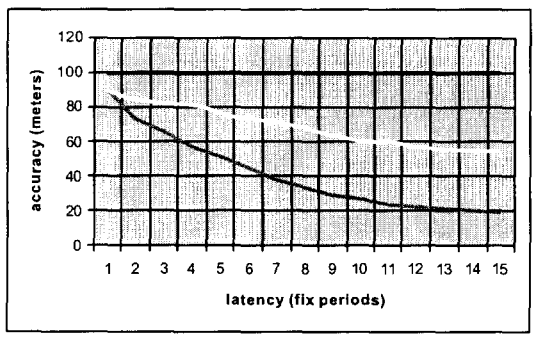


Figure 20: Light Urban environment, Stage III. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.



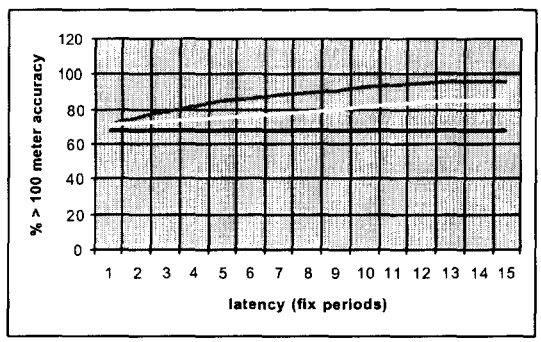


Figure 21: Industrial environment, Stage III. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

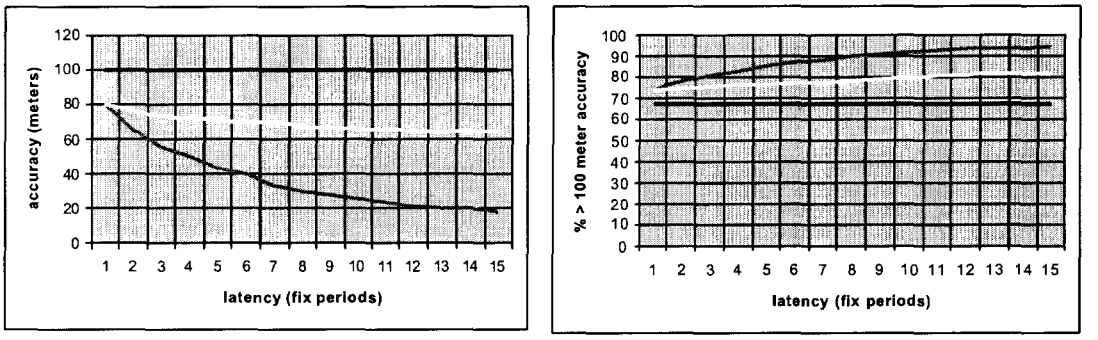


Figure 22: Residential environment, Stage III. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

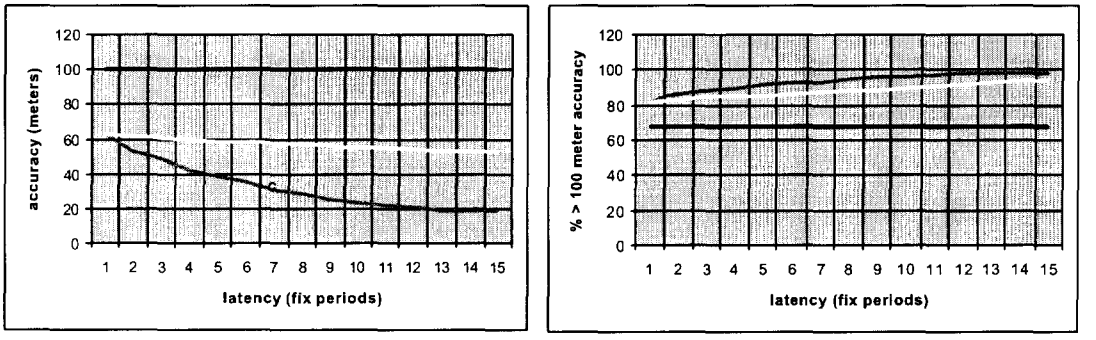


Figure 23: Suburban / Rural environment, Stage III. Left figure: 67th percentile accuracy vs. latency performance. Right figure: percentage of fixes with accuracy of at least 100m.

WIRELESS E9-1-1 CALL STATISTICS

During an eight-week period from June 28, 1999 to August 21, 1999, call-takers kept a log of wireless 9-1-1 calls received at the Billings, MT 9-1-1 Center. Since this information was recorded manually, it proved impossible to record all of these calls. Because of the large number of wireless calls received during a major incident, such as a grass fire or a vehicle accident with injuries, call-takers were too busy to record all wireless calls they received reporting these incidents. Although the results reported here provide a good "snapshot" of wireless calls received, the statistics are not based on a significantly large sample.

During the eight-week recording period, 538 wireless 9-1-1 calls were logged. Of these, 424 calls, or 79% of the total number logged, were either "hang-up" or "open line" calls– the call-taker was unable to make contact with the calling party, and it is likely that these calls were made to 9-1-1 in error.

Although the high number of misdialed wireless 9-1-1 calls has become a problem for all PSAPs, the percentage of total calls indicated here is probably higher than it would have been if all wireless calls had been logged. As stated above, not all legitimate 9-1-1 calls were logged during the busiest times, but probably all, or nearly all, of the open line or hang-up calls were logged, since these are so frustrating for the call-taker. They are time consuming because the call-taker must try to attract the caller's attention on an open line, and there is concern that the caller may be trying to report an actual emergency but has been prevented from doing so. Therefore the opportunity to bring these calls to someone's attention could not be ignored.

The following statistics are based on the 114 wireless calls that resulted in a conversation between the call-taker and the caller. The information logged was first divided into three general categories:

1. The caller was: stationary, mobile, or status was unknown.

2. The caller could provide an exact location, a location in a general area, or the location was not known.

3. The caller could provide a callback number, or the callback number was unknown.

In addition, call-takers recorded whether a location was needed to dispatch emergency help, and whether it was necessary to recontact the caller, thus requiring a callback number.

Table 13 shows the number of calls in each category. Of the 114 wireless 9-1-1 calls logged:

- 83 callers were mobile, 16 were stationary, and the status of 15 callers was not known;
- 73 callers could provide an exact location, 20 callers could provide their location within a general area, and 21 callers could not provide any location information;
- 81 callers could provide a callback number, 33 callers could not provide a callback number.

Table 13: Status of 9-1-1 calls and the caller's knowledge of their own location & callback number.

		Location Information			Callback Number	
Status of Caller	Total Calls	Exact Location Known	General Location Known	No Location Known	Known	Not Known
Mobile	83	59	12	12	59	24
Stationary	16	6	5	5	13	3
Unknown	15	8	3	4	9	6
Open Line or Hangup	424	•	•	•	•	•
Column Total	538	73	20	21	81	33

Table 14 shows the number of calls for which the location was needed when:

- The location was unknown;
- The exact location was known;
- The general area was known.

Additional information is provided regarding the need to recontact the caller, and whether the phone number was provided to the call-taker.

Figures 24 - 26 show the percentage of callers in each of the following categories:

- Caller was mobile or stationary;
- Location of the caller was known or not known;
- A callback number was known or not known.

Table 14: Necessity for location and callback number information when handling live 9-1-1 calls.

	Location Needed For Dispatch			Callback Number Needed	
	Location Unknown	Location Known: Exact Area	Location Known: General Area	Unknown	Known
Location Needed for Dispatch	21	53	17	•	•
Location Not Needed	6	5	5	•	•
Callback Number Needed	•	•	•	3	11
Callback Number Not Needed	•	•	•	30	70

Although the percentage of callers unable to provide a location was fairly small, any delay of emergency response due to lack of sufficient information can be life threatening or even fatal. Some comments written by the Billings 9-1-1 Center call-takers demonstrate the need for good location information as quickly as possible:

- "Caller from out of town reporting 1 vehicle rollover accident with injuries. Complainant had no idea where he was."
- "3 drowning at Conner Dam in capsized boat." (Caller could give general location only.)
- "This was a 3 car pileup between Lockwood & Johnson. It would have been nice to have a specific location." (Caller could give general location only.)
- "EMS/man down in alley" (caller could give general location only; this caused some delay in locating the victim.)
- "Female yelling into phone - [then] phone disconnected." (Call-taker unable to obtain any information. Caller did not call back.)

For the first four examples, emergency response was delayed while the call-taker tried to obtain accurate location information. In the fifth example the call-taker was left wondering if someone, desperately in need of emergency assistance, was forced to go without such help because she was unable to communicate clearly and unable to stay on the line.

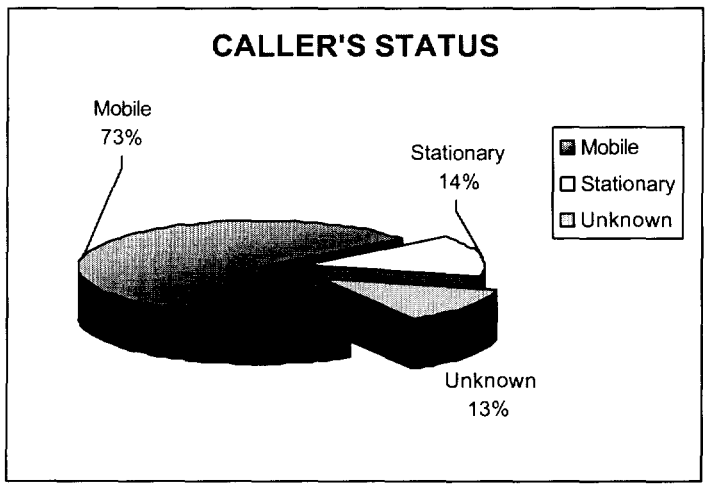


Figure 24: Mobility status of 9-1-1 calls.

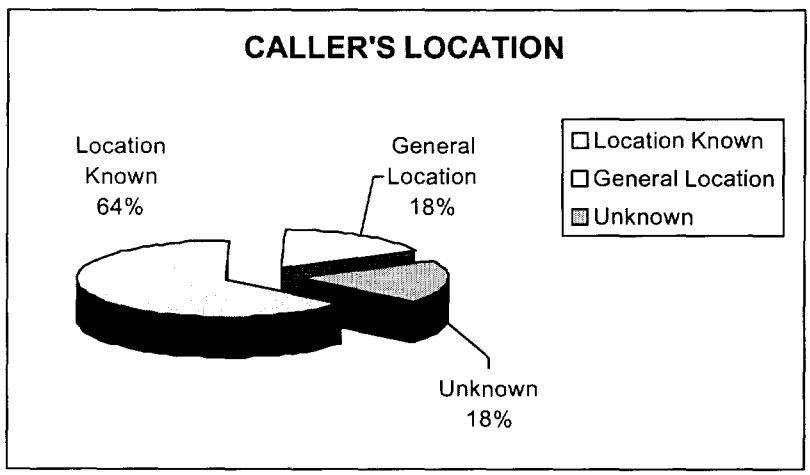


Figure 25: Caller's knowledge of their location at the time of the 9-1-1 call.

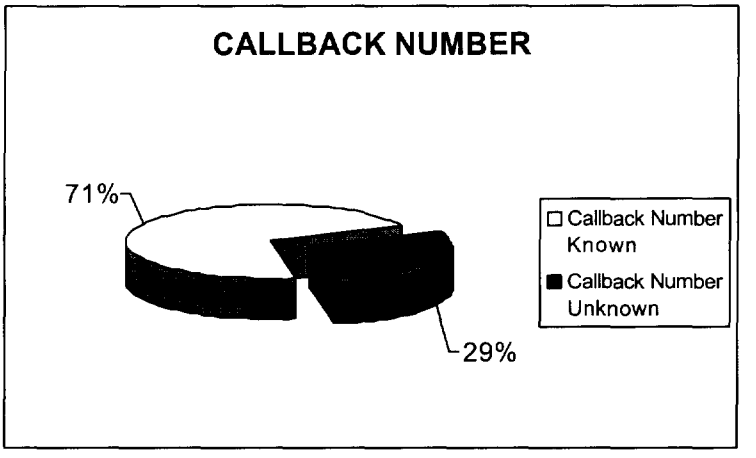


Figure 26: Caller's knowledge of their own callback number.

6 CONCLUSIONS

The Montana Wireless E9-1-1 Trial has successfully completed the design, deployment, and evaluation of a wireless E9-1-1 system in the greater Billings, MT area. The system incorporated the RadioCamera™ geolocation system by US Wireless Corporation, and demonstrated its suitability for use in wireless E9-1-1. In particular, the trial system was shown to surpass the FCC requirement of 100-meter accuracy for 67% of location fixes, by obtaining a final accuracy of 85.7 meters for the overall test environment. In addition, the system was able to achieve this accuracy with very little added latency in call setup time – approximately 1.14 seconds for 67% of the location fixes. This latency is well within allowable limits, and significantly less than the latencies of 5-10 seconds reported in similar trials of alternative solutions for wireless E9-1-1.

As expected, the best overall system performance was achieved in Stage III of testing due to the system enhancements and optimizations conducted between the trial stages. When the observation interval was limited to a single fix, the best performance was reported for the suburban / rural environment in which an accuracy of 62.7 meters for 67% of the location fixes was achieved. The weakest performance was reported for the light urban environment, for which an accuracy of 125.8 meters was achieved. It should be noted that in general, the performance of the system in both the rural and urban environments is quite comparable. However, due to the arbitrary selection of fixed and mobile test points in each environment, the urban environment was assigned a higher percentage of fixed and indoor test points. In general, the RadioCamera™ system performance for such points will not be as accurate as those achieved for mobile or fixed outdoor points.

When the observation interval was extended to longer periods, the trial system was able to demonstrate dramatic performance improvement. Such improvements could prove useful in E9-1-1, as the caller's location is continuously tracked throughout the call. An improvement in accuracy of 20 to 40 meters was not uncommon. A summary of the range of 67th percentile accuracy performance is provided in Table 15, as a function of test environment and length of observation interval.

Table 15: Final 67th percentile accuracy performance achieved as a function of test environment and length of observation interval.

	Observation Interval	
Environment	**single fix only**	**up to 15 fixes**
Light Urban	125.8 m	84.9 m
Industrial	89.2 m	54.7 m
Residential	79.2 m	64.7 m
Suburban / Rural	62.7 m	52.9 m
Combined	85.7 m	62.0 m

6.1 Performance Improvements

As a result of the performance analysis conducted during the Montana Wireless E9-1-1 Trial, several areas for potential system improvement have been identified. Perhaps the most significant area for improvement is in the development of an improved confidence factor to characterize the quality of the location estimates. This is particularly important for those instances in which a longer observation period is possible, or continuous location estimates will be made. For example, Table 16 shows the accuracy performance improvement that could have been achieved, provided the quality factor was able to select the most reliable location estimate from within the set of estimates. Note that this improvement requires absolutely no change to the basic RadioCamera™ measurement or location algorithms – but simply a change in how the *quality* of the estimates is characterized. The overall system accuracy could be improved to within approximately 20 meters for those cases permitting an observation interval of up to 15 fixes.

Table 16: Potential accuracy performance attainable through optimization of the quality factor.

	Performance achieved for:		
Environment	**Current Quality Factor**	**Optimized Quality Factor**	**Net Improvement**
Light Urban	84.9 m	25.8 m	59.1 m
Industrial	54.7 m	18.8 m	35.9 m
Residential	64.7 m	18.0 m	46.7 m
Suburban / Rural	52.9 m	17.8 m	35.1 m
Combined	62.0 m	19.7 m	42.3 m

6.2 Looking Forward

While the Montana Department of Administration is not endorsing any particular wireless location technology, the RadioCamera™ system clearly demonstrated the ability to locate wireless 9-1-1 callers within the FCC requirement of 100-meter accuracy for 67% of the calls. In fact, the system's ability to continually update the location information for a moving caller surpasses the FCC's requirements and could provide extra benefit to the call-taker by providing the ability to update the "first fix" location information and thereby display more accurate location information as the incident progresses. In addition, the call-taker could receive updated location information from a moving caller, such as a citizen following an intoxicated driver or a suspect vehicle.

Although several trial participants moved on to other projects and commitments at the end of this trial, the possibility of developing a new, expanded project has been considered. Several options have been discussed, ranging from conducting a similar trial using actual 9-1-1 calls to the Billings public safety answering point (PSAP), to designing another project with a much larger scope that would involve numerous participants.

One of the more ambitious projects being considered is a "Rural Public Safety Pilot Project." This project would seek to develop, deploy, and evaluate advanced wireless location technologies to facilitate detection and location of wireless 9-1-1 callers, enhance the dispatch of emergency response units, and to detect and monitor such incidents.

With the passage of the Wireless Communications and Public Safety Act of 1999, sponsored by Montana Senator Conrad Burns, national attention has been directed to the need to improve public safety response, particularly in rural areas. We wholeheartedly agree with Section 2 (3) of this Act that "emerging technologies can be a critical component of the end-to-end communications infrastructure connecting the public with emergency medical service providers and emergency dispatch providers, public safety, fire service and law enforcement officials, and hospital emergency and trauma care facilities, to reduce emergency response times and provide appropriate care;"

We believe the RadioCamera™ system has the potential to provide the location technology needed for such a project, and, if sufficient funding can be obtained, we hope to involve wireless service providers, public safety agencies, health service providers, the Montana Department of Transportation, various technology/service providers, and the Western Transportation Institute/Montana State University in this project. We believe that information gained from such a project will add to the valuable store of knowledge being gathered nationwide about the use of location technology to improve emergency response times.

New projects notwithstanding, we hope the findings in this report will provide a valuable addition to the information currently available regarding wireless location technology. The number of wireless 9-1-1 calls made each day in this country and around the world is making a significant impact on emergency telephone systems, and the number of these calls increases daily. It is extremely important that the 9-1-1 community and wireless service providers make the most informed decisions possible to determine the technology they will use to provide Phase II of the FCC's Report and Order 94-102.

ATTACHMENT C

Pueblo, Colorado Analysis

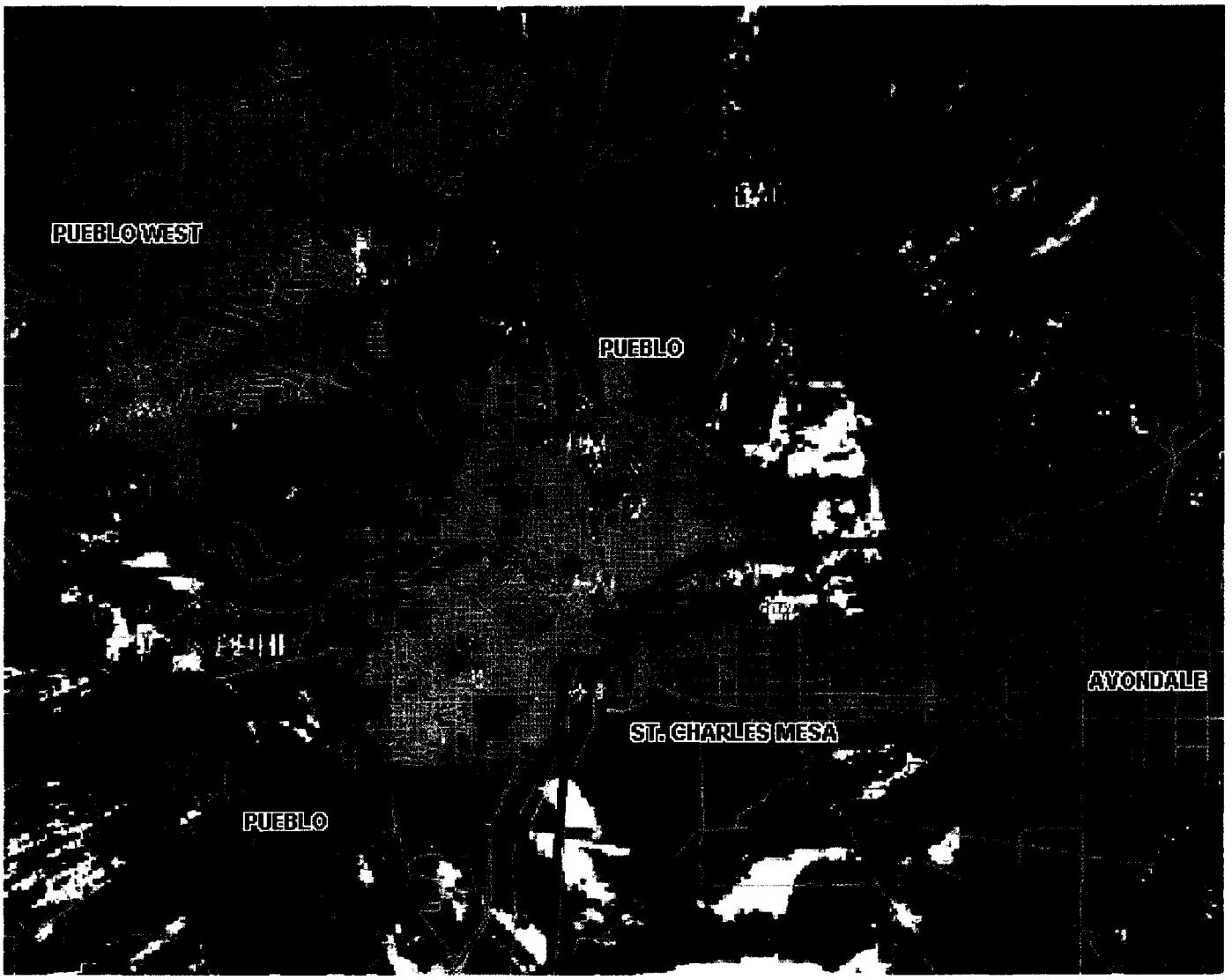
To determine if other network-based solutions suffered from the same shortcomings as US Wireless' solution when operating in rural areas, in February 2001, Western worked with another vendor to analyze the performance of its location identification solution in rural areas. For this test, Pueblo, Colorado cell site data and the general geographic conditions of the area were used to create a model upon which this vendor's solution was "installed" and deployed. The Pueblo area was chosen for this analysis because it contained both urban and rural areas in close proximity. The computer model simulation produced results that, similar to the Billings trial, provided only limited location identification, with the stronger, more accurate readings coming in the more populated areas where the deployment of cell sites was more dense.

Figure 1, below, demonstrates the location performance in and around the town of Pueblo. As expected, most areas can support FCC-compliant location identification with the exception of areas in the shadow of terrain features. This characteristic is typical of less-rural Western markets that have greater site separation as compared to the top 50 urban markets in the United States.

Figure 2, below, demonstrates the performance in rural areas east of Pueblo where five cell sites provide coverage stretching to the Colorado border. This area is typical of rural areas served by Western. For this test the vendor found it necessary to add two additional cell sites (a 40% increase in site count) to provide any location service in the eastern edge of the coverage area. With these two additional cell locations, Phase II service could be provided to nominally 50% of the coverage area.

In summary, the results are consistent with the earlier trial. That is, compliance with FCC Phase II requirements in less-rural areas with a high concentration of cell sites is possible, but compliance cannot be achieved in rural areas with a network-based technology.

TDOA/AOA Network Solution Provider



- Core Pueblo estimated location performance.
- Figure 1

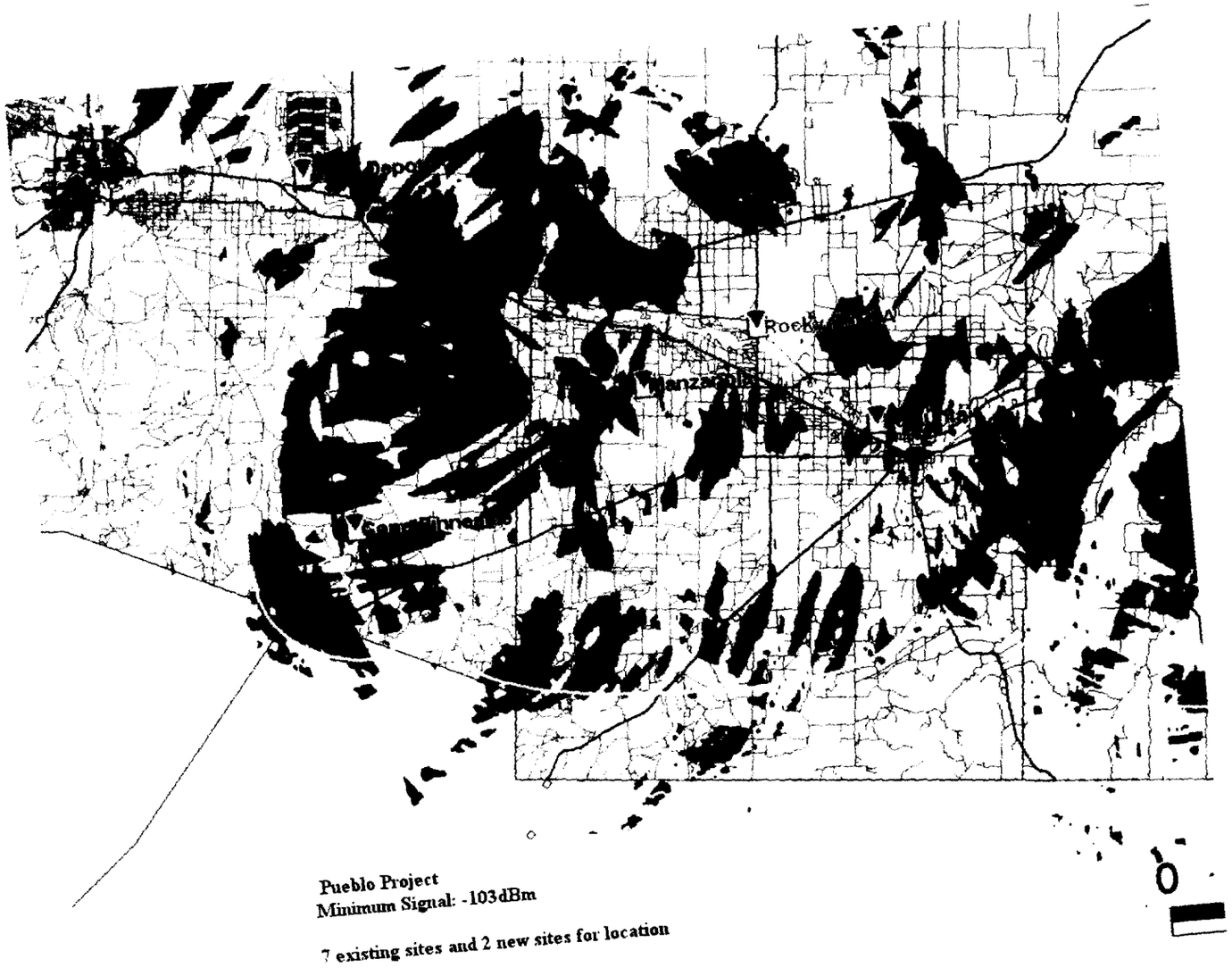

Pueblo Project
Minimum Signal: -103dBm
7 existing sites and 2 new sites for location

Figure 2

ATTACHMENT D

NOKIA

July 25, 2001

Richard Hecht
Executive Director Product Procurement
Western Wireless
3650 131st Street Avenue SE
Suite 400
Bellevue, WA 98006

Dear Richard;

Nokia has received your inquiry regarding the E-911 phase II mandate. According to our product road map for 2001 and 2002, Nokia will have a handset during the later part of the second half of 2002 that supports GPS functionality.

Please let me know if you require additional information. Thank you for your time and cooperation.

Best Regards,

Albert Seda

Albert Seda
Customer Development Manager

CC: Ron Rudokas
Executive Director of Engineering

NOKIA MOBILE PHONES, INC.
12278 Scripps Summit Dr., San Diego, CA 92131
Tel: 858/831-5000
Fax: 858/831-6500

MOTOROLA

August 30, 2001

Mr. Nathan Glazier
Western Wireless Corp.
3650 131st Ave. SE, Suite 400
Bellevue, WA 98006

Dear Nathan,

The following is the response from our Carrier Insights & Commitments Group in regards to your request for information regarding handset-assisted technology to meet Phase II requirements of Enhanced 9-1-1 (E911). If you have any questions, please give me a call.

Motorola is working to provide Western Wireless terminals and accessories that will provide location functionality per FCC requirements. At this time, it is the opinion that AGPS is the most viable solution to this issue. Motorola's timeframe for developing AGPS equipped / capable terminals is currently the 3Q2002. The actual platform, costs, and method of implementation (via accessory or built-in) are all to be determined. Motorola encourages Western Wireless to offer its observations and inputs to the many aspects of this design.

Sincerely,

Arne Arnesen
Product Marketing Manager
Motorola
(815) 884-4560

ATTACHMENT E

DECLARATION OF RICHARD HECHT

I, Richard Hecht, hereby declare and state as follows:

I am employed as the Executive Director of Sales and Distribution for Western Wireless Corporation ("Western") and have been employed with the Company since 1996. I make this Declaration in support of Western's Petition for Waiver of Section 20.18(g) (the "Petition"). All facts stated herein are based upon my personal knowledge.

I am personally familiar with Western's efforts to implement a Phase II location solution and the difficulties associated therewith. I have reviewed the Petition and concur with the statements regarding the deployment of network-based solutions. I have had personal detailed discussions with handset vendors regarding the availability dates of Assisted Global Positioning System ("AGPS") enabled handsets. As a smaller, regional carrier, Western does not have access to the newest phones on the market at the same time as larger national carriers. Western is able to sell new phones from the manufacturers generally 90 days after the larger carriers.

Furthermore, approximately 8-10% of Western's existing customer base currently uses 3-watt analog phones. Based upon the rural nature of Western's service area and current usage of 3-watt analog phones by consumers, I believe a portion of our customer base will continue to use 3-watt analog phones in the foreseeable future.

I hereby declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed August 31, 2001

Richard Hecht
Executive Director Sales and Distribution

State of Washington
County of King

Subscribed and sworn to before me this 31st day of August, 2001. Witness my hand and official seal. My Commission expires on 2-10-04.

LORI L DIERST
COMMISSION EXPIRES
NOTARY PUBLIC
2-10-04
STATE OF WASHINGTON

Lori L. Dierst
(Notary)

ATTACHMENT F

NORTEL NETWORKS

Nortel Networks
1120 112th Avenue
Suite 500
Bellevue WA 98004 • USA
Tel 425 450 7500
www.nortelnetworks.com

August 30, 2001

VIA FACSIMILE

RE: E911 Phase 2 core network technology

Dear Mr. Rubin:

In this letter, Nortel Networks details its plans for making the E911 Phase 2 core wireless network technology (E911 technology available.

E911

Nortel Networks is committed to its part in enabling an end-to-end, E911 Phase 2 location information solution. As explained in this letter, Nortel Networks will supply the E911 technology enabling wireless carriers using its DMS-MTX switch, when interworking with other parties and technologies, to convey location information to the Public Safety Answering Point (PSAP).[1] Despite diligent development efforts, the E911 technology will be made generally available after October 1, 2001 as detailed in this letter.[2]

Required Components and Availability Details

The E911 technology for use with the DMS-MTX platform requires a combination of hardware and software which Nortel Networks has designed to operate in accordance with the E911 applicable J-STD-036 standard. The functional elements constituting the Nortel Networks E911 technology are switch software, RF Access system software, Mobile Positioning Center (MPC) and Positioning Determining Entity (PDE).

The E911 technology elements will be made generally available by Nortel Networks according to the following schedule.

Component	Role	GA Date
MTX10	Switch software	Q4 2001
NBSS10.1	RF access subsystem	Q4 2001

[1] The Nortel Networks DMS-MTX switch is generally used by carriers to support TDMA and CDMA wireless protocols. Note that the E911 technology does not support Satellite Assisted Mobile Positioning Systems (SAMPS) based TDMA handset solutions. This handset solution is not supported because Nortel Networks understands that no handset vendor plans market introduction of a SAMPS enabled handset.

[2] By generally available, Nortel Networks means that the product has been adequately tested, any corrections made and offered commercially to all carriers desiring to purchase or license the product or software.

NORTEL NETWORKS

Nortel Networks will make its combined MPC/PDE generally available in Q2 2002. Because the functions performed by the MPC/PDE are standards based, carriers using the Nortel Networks MTX platform may procure the necessary technology from other vendors and need not wait until Nortel Networks makes its MPC/PDE available to deploy E911. Finally, IOS version 4.0 must be deployed in carriers' networks with equipment from multiple vendors. The IOS software will become generally available in Q1 2002.

This schedule represents Nortel Networks' current plan. This plan could be altered by a number of factors, including unavailability of handsets for testing and resolution of technical issues identified through interoperability testing of the E911 technology with other vendors' technology contributions.

Even after general availability, carriers will need time to deploy the solution across the portions of their networks covered by validated PSAP requests.

Standards

As noted, the E911 technology is standards based. Applicable standards were only approved and published last year. Generally, 18 to 24 months are needed between standard adoption and development of compatible technology. As you will note from the discussion in the above section entitled "Required Components and Availability Details", Nortel Networks has bested or equaled the usual timelines for delivery of functionality after a standard is published.

Field Trial

Nortel Networks endorses an end-to-end field trial before a more extensive roll-out of the E911 technology takes place. The end-to-end field trial is important because, to address the overall goal of the delivery of location information to a PSAP, the E911 technology must successfully interwork with the E911 components supplied by other vendors as well as technologies supplied by other necessary parties, such as the location technology provider and the Local Exchange Carrier.

The successful conclusion of the trial will provide a validated solution across all necessary technologies and parties. To deploy a solution without an end-to-end field trial could lead to remedying the same issues multiple times in a serial fashion. Nortel Networks does not have the resources to deploy the E911 technology and then correct issues, that may well be identical, simultaneously. Other necessary parties, such as the location solution vendors and Local Exchange Carriers and even wireless carriers, may have similar limitations.

If you should have any questions, please contact Tony Smith, Director, Wireless Regulatory Affairs, Nortel Networks at 972-685-8779.

Sincerely,

Niel A. Covey

Niel A. Covey
Director of Sales

Lucent Technologies
Bell Labs Innovations

Michael Iandolo
TDMA/CDMA
Product Management
Vice President

Lucent Technologies Inc.
Room 3A385B
Whippany, NJ 07981

Office: 973-386-2897
Facsimile: 973-386-6038
miandolo@lucent.com

August 10, 2001

Lucent Technologies is aware that many carriers have filed extension requests of the E911 Phase II deadlines with the FCC. Accordingly, we are providing you with up-to-date information regarding the availability of our E911 Phase II network compliance features.

While Lucent originally estimated that our E911 network features would be Generally Available (GA) in early September, due to changes in mobile software, limited access to over-the-air test facilities and the availability of Assisted-GPS mobiles, final testing has been delayed. These issues have been resolved and we are now proceeding with the First Office Application (FOA).

The FOA will be conducted using CDMA Software Release 17.1. The new target GA date for the following E911 Phase II compliance features is November 9, 2001:

- **FID 3581.0**: E911 Phase II compliance (j-std-036)
- **FID 3581.1**: CDMA Enhancements for E911 Phase II
- **FID 4403.0**: Flexent Position Determination Equipment (PDE)
- **FID 3581.2**: More CDMA Enhancements for E911 Phase II (This feature helps refine the location of mobiles when a pure GPS fix is not possible.)

Lucent recognizes that E911 Phase II is a vital service for wireless subscribers, enabling quick location identification of a mobile phone user in an emergency. We are committed to providing the appropriate network compliance features in the most expedient manner possible. The new GA date will ensure our solution is well tested, fully integrated with handsets and other components, and standards-compliant before making it available to wireless operators.

Sincerely,

cc: M. Chan

CERTIFICATE OF SERVICE

I, Eric Butts, do hereby certify that on this 31st day of August 2001, a copy of the foregoing Petition for Waiver was served by hand delivery on the following parties:

Peter A. Tenhula
Senior Legal Adviser
Office of Chairman Powell
Federal Communications Commission
445 Twelfth Street, S.W. Room 8-A204
Washington, DC 20554

Monica Shah Desai
Interim Legal Advisor
Office of Commissioner Martin
Federal Communications Commission
445 Twelfth Street, S.W. Room 8-C302
Washington, DC 20554

Adam D. Krinsky
Senior Legal Adviser
Office of Commissioner Tristani
Federal Communications Commission
445 Twelfth Street, S.W. Room 8-D115
Washington, DC 20554

Bryan Tramont
Senior Legal Adviser
Office of Commissioner Abernathy
Federal Communications Commission
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Paul Margie
Legal Adviser
Office of Commissioner Copps
Federal Communications Commission
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Thomas J. Sugrue
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Gerald P. Vaughan
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Kathleen O'Brien Ham
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Kris A. Monteith
Wireless Telecommunications Bureau
Federal Communications Commission
445 Twelfth Street, S.W. Room 3-C124
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Jennifer Tomchin
Wireless Telecommunications Bureau
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Jay Whaley
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Federal Communications Commission
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Eric Hugh Butts

Eric Butts