

STUDY OF FM RADIO-ENABLED HANDSETS IN THE US

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PO Box 34 • Mountain Lakes, New Jersey • 07046 USA
973-541-5551 phone
reports@insight-corp.com <http://www.insight-corp.com>

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1.0 Executive Summary

Through its FASTROAD technology advocacy program, the National Association of Broadcasters (NAB) seeks to understand how many FM radio-enabled handsets were sold in the US in 2008 and 2009. In addition, NAB would like to see an estimate of future FM radio-enabled handsets prospects.

INSIGHT Research estimates that in 2008, six percent of the handsets sold in the US were FM radio-enabled. This increased to about 9.5 percent in 2009. A previous study ("*Study of the Potential for FM Radio to be a Universal Feature on Cellular Handsets*" (National Association of Broadcasters, May 2008) looked at the market in 2007 and estimated that eight percent of wireless devices shipped had an FM radio chip installed. The percentage of handsets with chips installed will be higher than the percentage of FM-radio enabled handsets because we know that some carriers disable this chip. Therefore, the findings of the current study are entirely consistent with the 2008 study though the methodology and units counted (shipments vs. sold units in the current study) were somewhat different.

The FM radio feature has been integrated into the wireless chipset offered by several vendors. The feature is relatively inexpensive and an interesting differentiator. The only way to accurately determine the percent of handsets with an FM chip installed is to match each handset with its associated chipset, which would require reverse engineering of all handsets on the market in 2008 and 2009. Such an effort was beyond the scope of the current study. Suffice it to say that the number of handsets with the FM radio capability that have been disabled could be significant. For example, we know that the iPhone 3GS is sold with the FM radio

disabled, although its chipset (Broadcom 4325) is capable of providing FM radio. It is likely that other handsets which use this chipset or another also have the FM radio capability disabled.

INSIGHT's research suggests that each individual carrier makes the decision about whether to enable or disable the FM radio feature. Few US carriers have done much to promote the feature in handsets with the FM radio capability, and some have ignored it altogether.

Regarding future prospects, consumer demand for FM radio on the handset has not surfaced in the US at the level it has in other countries. Lack of consumer awareness about the feature may be a factor. Lacking overt consumer demand and carrier interest, the feature could languish. Demand could increase if the consumers viewed the feature in terms of public safety. FM radio-enabled wireless handsets could be an effective tool to disseminate emergency information, but again there appears to be little awareness about such an application in the US at this time. INSIGHT's view is that chipset designers will continue to include the feature since there is worldwide demand for it, however, in terms of the US handset market, the feature will simply get swept into designs because it is available —and not because of pent-up demand in the US market.

Use by consumers of the FM radio feature is likely to remain low unless they become more aware of its availability. A number of actions to increase awareness are discussed in Section 7.0 Other Recommendations.

2.0 Objectives

The NAB would like to know the number of cell phones in the US that have FM radio receiver chips and can receive FM radio signals. A more comprehensive list of the requirements of this project is shown below:

1. Number of cellular handsets sold in the United States in 2008 and 2009.
(We count only actual units sold, not simply those shipped.)
2. Number of those handsets that included an FM radio chip. (Also expressed as a percentage to overall domestic handset sales.)
3. Number of cellular handsets sold in US in 2008 and 2009, which not only possess an FM chip, but are also FM radio-enabled. (Also expressed in terms of percentage to overall domestic handset sales.)
4. By “FM radio-enabled” we mean cellular devices in which the consumer can walk out of the store and receive an FM radio broadcast on their cellular handset devices. From a technological standpoint, we will document if there is a requirement for an upgrade, activation of FM signal from the provider, or the requirement of downloading a special application on certain devices.
5. A list of cellular device models sold in US (2008 and 2009) that are “FM radio-enabled” (as described above), and the sales numbers for these devices.

6. Projected growth rate for FM radio-enabled devices 2010-2015.

3.0 Methodology

INSIGHT Research utilized a combination of primary and secondary market research to gather data about the market for FM radio-enabled handset devices. Primary research included interviews with representatives of major wireless carriers and other wireless industry representatives. Secondary sources included reviews of technical specifications of major wireless handset manufacturers, information on the number of wireless subscribers and handset sales published by manufacturers, industry trade associations and tracking services.

The forecast for FM radio-enabled devices was established using the following methodology:

- 1) Identify carriers and the specific handset models they sold in 2008 and 2009 that offer FM radio.
- 2) Estimate the total handsets sold in the US in 2008 and 2009.
- 3) Estimate handsets sales by carrier in 2008 and 2009.
- 4) Estimate percentage of sales of FM radio-enabled handset devices based on store checks, interviews with company representatives, and company reports.

- 5) Aggregate the number of FM radio-enabled handsets from all carriers for 2008 and 2009.
- 6) Conduct a consistency check on the total number with other industry sources.

Section 4.0 Carrier Analysis looks at the major carriers and identifies the specific FM radio-enabled handsets sold in 2008, 2009 and other years. It also provides additional background information on how the carrier uses the feature to promote the sale of handsets.

Section 6.0 estimates the total handsets sold in the US in 2008 and 2009. In that section we also present our results for item five above.

4.0 Carrier Analysis

4.1 T-Mobile

T-Mobile currently has a relatively robust line up of phones with FM radio-enabled handset devices. At one retailer, three of 20 handsets currently offered included this feature—although it was not mentioned on the display card describing the product. Store checks indicated that some sales reps were more familiar with the FM feature than others. Sales clerks were savvy enough to realize that the consumer was looking for music on the phone and that FM radio was only one means to provide it. They were quick to point out that there are

other ways to get music and that the consumer should not limit their selection to just the three phones with that feature.

Table 4.1 FM Radio-Enabled T-Mobile Handsets

Manufacturer	Model	Approximate Release Date	Sold in 2008	Sold in 2009
Sony Ericsson	TM 717 (Equinox)	4Q09		Yes
Nokia	5130	3Q09		Yes
Motorola	Zine ZN5	4Q08	Yes	Yes
Nokia	2760	3Q08	Yes	Yes
Nokia	5610	3Q08	Yes	Yes
Sony Ericsson	TM 506	3Q08	Yes	Yes
Nokia	5310	3Q08	Yes	Yes
Nokia	6301	2Q08	Yes	Yes
Motorola	ROKR E8	2Q08	Yes	Yes
Nokia	6263	4Q07	Yes	Yes
Nokia	6133	4Q06	Yes	
Nokia	6103	2Q06	Yes	Yes
Nokia	8801	2Q06		

4.2 AT&T

AT&T offers phones that are designed with an FM radio chip; however, AT&T staff could not provide any details on how to enable the feature.

In our store checks, the first response to a question about FM radio was a description of Pandora.com. The store personnel were very familiar with this music service and eager to sell a higher priced data plan that would include use of this service.

We pointed out to the store representatives that certain models on display in the store had FM receiver chips in the hardware based on our review of manufacturers' specifications. The sales reps searched through their sales literature but could find no reference to this feature.

Several Internet forums had postings by consumers that had purchased these phones and were attempting to activate the FM radio feature (see Appendix). These consumers sounded quite frustrated by the fact that the carrier failed to provide adequate instructions on how to use the feature. It was obvious from these threads that AT&T Wireless and some other carriers are not all that interested in providing this feature to their subscribers.

We contacted LG after visiting the AT&T store. LG provided instructions on how to find the FM radio feature. It is also described in the LG manual. Similarly, we contacted AT&T technical support and asked the same question about the same

phone. AT&T technical support was not able to provide instructions on how to access the FM radio feature.

The following list of phones offered by AT&T Wireless have an enabled FM receiver chip.

Table 4.2 FM Radio-Enabled AT&T Handsets

Manufacturer	Model	Approximate Release Date	Sold in 2008	Sold in 2009
HTC	Tilt2	4Q09		Yes
HTC	Pure	4Q09		Yes
Sony Ericsson	C905a	2Q09		Yes
Sony Ericsson	W578a Walkman	2Q09		Yes
LG	Neon	2Q09		Yes
Motorola	EM 330	1Q09		Yes
LG	Incite	4Q08	Yes	Yes
Nokia	2600	4Q08	Yes	Yes
HTC	Fuze	4Q08	Yes	Yes
Sony Ericsson	W760a	3Q08	Yes	Yes
Sony Ericsson	W350a	3Q08	Yes	Yes
Sony Ericsson	Z750a	4Q07	Yes	Yes
Sony Ericsson	W580i Walkman	3Q07	Yes	
Nokia	6085	3Q07	Yes	

4.3 Verizon

Verizon has offered far fewer FM radio-enabled handsets than either T-Mobile or AT&T. Verizon Wireless' first models with the FM feature were the HTC Touch

Diamond, Samsung Omnia II and the LG Chocolate VX8575. All of these were introduced in 2009. For a very brief period of time, Microsoft introduced the “Kin” line (Kin One and Kin Two) in May 2010. Both were FM radio-enabled, were manufactured by Sharp, and picked up by Verizon—and subsequently dropped by Microsoft. Microsoft abandoned the project after about six weeks. Sales of these units were estimated at about 500 units.

Store checks with Verizon Wireless indicated that some—but not all— personnel are familiar with the FM radio feature in the VX 8575. Other Verizon personnel could not confirm that the feature was available after searching in their online databases.

The following list of phones offered by Verizon Wireless are FM radio-enabled:

Table 4.3 FM Radio-Enabled Handsets from Verizon Wireless

Manufacturer	Model	Approximate Release Date	Sold in 2008	Sold in 2009
Sharp	Kin Two	2Q10 – but discontinued		
Sharp	Kin One	2Q10 – but discontinued		
Samsung	Omnia II	4Q09		Yes
LG	Chocolate VX8575	4Q09		Yes
HTC	Touch Diamond	2Q09		Yes

4.4 Sprint/Nextel

Sprint/Nextel introduced the HTC EVO 4G in 2010, an FM radio-enabled handset. According to a company spokesperson, Sprint had offered a Nokia handset with the FM radio feature (we believe that was the Nokia PM 6225, first introduced in 2004).

The response at the Sprint/Nextel retail store was similar to that at AT&T. The sales rep was very familiar with Android applications that could stream the content from specific FM radio stations. The in-store reps were not aware that the EVO 4G had the feature integrated in the device.

The following list of phones offered by Sprint/Nextel are FM radio-enabled:

Table 4.4 FM Radio-Enabled Handsets from Sprint/Nextel

Manufacturer	Model	Approximate Release Date	Sold in 2008	Sold in 2009
HTC	Touch Diamond	3Q08	Yes	Yes
HTC	Touch	3Q06		
Nokia	PM 6225	3Q04		

4.5 Other Carriers

The other US-based carriers have been grouped together because of their smaller subscriber base. Some of these carriers have introduced FM radio-enabled handsets as well as shown in Table 4.5.

Table 4.5 FM Radio-Enabled Handsets Offered by Other Carriers

Manufacturer	Carrier	Model	Approximate Release Date	Sold in 2008	Sold in 2009
Nokia	MetroPCS	6265i	4Q06	N/A	
Nokia	Leap Wireless	6275i	3Q07	Yes	

Our sense, after conducting store checks and talking to carrier representatives, is that there is currently little interest in selling the FM radio feature. One company rep told us that the consumers are just not very interested in the feature.

5.0 Other Considerations

Comscore is one firm that tracks patterns of consumer usage for mobile devices, and they also look at factors that drive consumer purchase decisions. We examined recent Comscore studies to determine any patterns concerning the FM radio feature. One recent study indicated that only 13 percent of US consumers listen to music on their cell phone.

Table 5.1 Mobile Content Usage*

	Share (%) of US Mobile Subscribers		
	Nov-09	Feb-10	Point Change
<i>Total Mobile Subscribers</i>	100.0%	100.0%	N/A
Sent text message to another phone	62.1%	64.0%	1.9
Used browser	27.0%	29.4%	2.4
Used Downloaded Apps	25.7%	27.5%	1.8
Played games	21.4%	21.9%	0.5
Accessed Social Networking Site or Blog	15.1%	18.0%	2.9
Listened to music on mobile phone	11.8%	13.1%	1.3

* Three Month Avg. Ending Feb. 2010 vs. Three Month Avg. Ending Nov. 2009, Total US Age 13+
Source: Comscore Press Release April 5, 2010

This means that only 13 percent of the consumers use their handset to listen to music *from all sources*. One hypothesis might be that all of these consumers (13 percent of the total) would be attracted to an FM radio-enabled handset. The highest possible penetration that FM radio-enabled handsets could hope to achieve, based on listening to music, thus would be 13 percent.

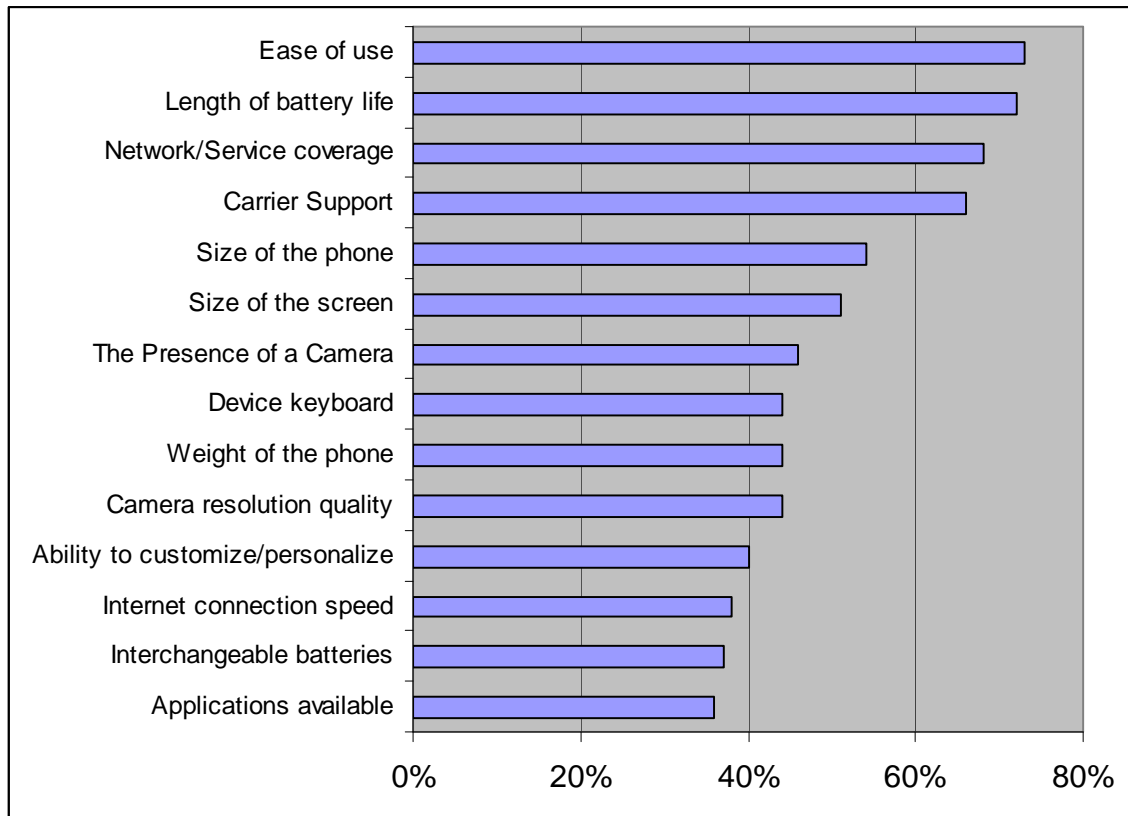
Music is but one application for FM radio-enabled handsets. Certainly such devices can be used for news, information, and other entertainment as well. In addition, FM radio-enabled handsets could aid in public safety since they can disseminate emergency information. However, the application of FM radio enabled handsets disseminating emergency information was not considered in this analysis but obviously could have great benefit for consumers and drive demand for the feature.

FM radio enabled handsets are but one means the consumer has to receive music. Many phones have MP3 players which can satisfy the consumer's desire for music. 3G phones have the ability to stream music from traditional FM stations and Internet radio. Verizon Wireless has a proprietary music service branded VCast. Therefore, the 13 percent that listen to music would be an upper bound in 2010 for FM radio-enabled penetration.

It is likely that as the number of users that listen to music on a handset will increase beyond 13 percent over time since the penetration rate for such services typically builds its base gradually. If that occurs, it is likely to drive demand for FM radio receivers in cell phones. To some extent the cell phone needs to be repositioned in the retail channel as more than a phone. It can be a device for music and news and this message must reach the population at large.

A similar study conducted earlier in 2010 investigated the factors that phone buyers look at in making a decision to purchase a phone. As shown in Figure 5.1, music is not one of the top 13 items on the list.

Figure 5.1 What Do Phone Buyers Want?



Source: As presented at CES by Comscore on January 10, 2010 and available on the Comscore web site

Music could be considered an application and therefore be counted under item number 14. Certainly, music is an important consideration for many of the consumers that purchase an iPhone, but the iPhone only represents about four percent of the installed base at this time.

The iPhone 3GS incorporates the Broadcom 4325 chipset. We know this based on reverse engineering done by phonewreck.com. This chipset makes possible Bluetooth, WiFi and FM radio reception. However, the FM radio feature is not

enabled in the iPhone 3GS. In late 2009, a rumor circulated on the web site 9to5Mac that Apple was considering a software upgrade that would activate the feature. To date there has been no software update to activate the feature and no comment from Apple. A similar situation exists for the iPhone 4G. It is based on a more advanced Broadcom chipset which also has integrated FM radio. The iPhone 4G also does not have the FM radio feature enabled.

This one example suggests that there may indeed be a significant number of handsets sold in US with an embedded FM radio capability, but the FM radio feature has not been enabled. INSIGHT did not attempt to match every chipset to every handset; such reverse engineering was beyond the scope of the current study. While we do not have the reverse engineering data to create a definitive count of the number of the handsets with an integrated FM radio capability, our research suggests the numbers are significant.

Further, our research revealed that a number of consumers have trouble accessing the FM radio feature in their existing device. This is consistent with the fact that many carriers neither promote the feature during the sales process nor provide instructions on use during post sale support. Most cell phones require an FM antenna in order for the FM radio icon to appear in the menu. The consumer must plug in a pair of headphones which will act as the antenna. Users that rely on a Bluetooth earpiece will not have the correct antenna attached to the cell phone. In many cases, the headphones are an additional accessory that is not included with the device and must be purchased separately. Unless the consumer purchases the headphones and attaches them to the device, they may never see that the FM radio application is available.

We reviewed many users' manuals of the phones that are FM radio-enabled. They provide concise directions on how to reach the FM radio icon, but few consumers search through the entire user's manual to understand all of the available features.

Similarly, in some cases the technical representatives of the carrier were unable to provide instructions on how to locate the FM radio icon. We had to contact the manufacturer for specific instructions. Even then, it was not readily available. The technical rep needed to search for some time to locate the instructions on how to turn on the FM radio.

One other point merits an explanation. The 2008 NAB study previously mentioned shipments in 2007, and the numbers were quite a bit higher than the 2008 sales we report in Section 6.0. There are a number of reasons why shipments and sales may differ:

- 1) *Cell phone insurance plans* — The original cell phone is counted as a sale. If it needs to be replaced for loss or failure it is not a sale but covered under insurance. In this case we would count two shipments but only one sale.
- 2) *Free phones* — In the case of a free phone there is one shipment but no sale.
- 3) *Two for one sales* — Many carriers run these types of promotions. It is clear that the first phone is sold. It is not clear how the second phone is counted. It is clear that there are two shipments and there could be only one sale.

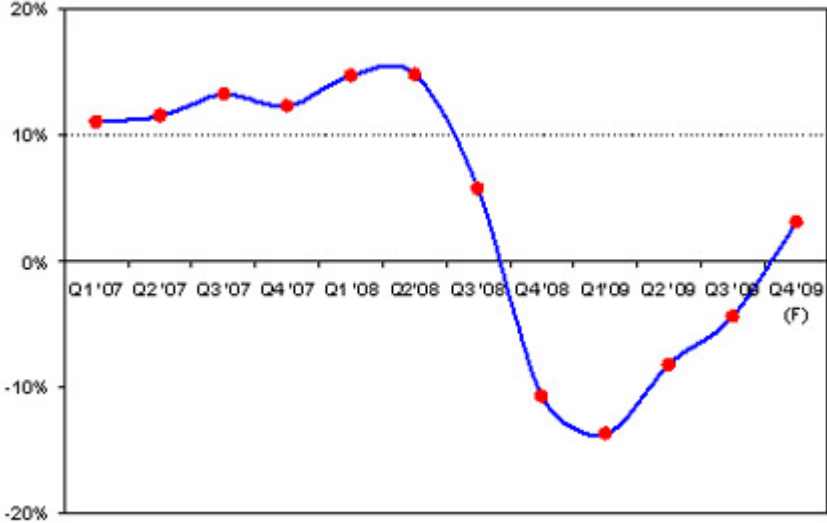
4) *Consumer preference* — Most carriers have given sales reps some leeway in satisfying customer complaints. If a customer returns a phone they don't like, the sales rep will reverse the sale provided the customer will purchase another handset. The original handset goes back to the factory for packaging as a new or refurbished unit. The unit is then shipped to the carrier a second time: hence, one sale and two shipments.

6.0 Estimated FM Radio-enabled Handset Sales

6.1 Data Requested for 2008 and 2009

In order to determine the number of handsets sold in the US in 2008 and 2009 we referred to data published by Gartner, Strategy Analytics, IDC and INSIGHT Research proprietary databases. Many of these firms publish data on a global basis. During this time, the global handset market went through quite a turbulent period as shown in Figure 6.1

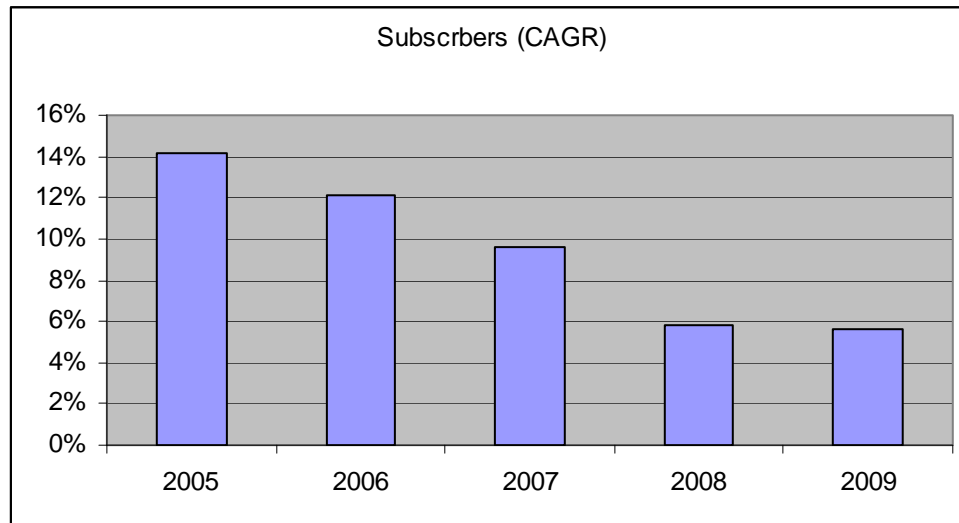
Figure 6.1 Global Handset Sales Growth



Source: Strategy Analytics as published by fiercewireless.com

The growth in the US market slowed somewhat, but the decline was not as drastic as in the global market. Total number of subscribers continued to grow during 2008 and 2009 as shown in Figure 6.2.

Figure 6.2 US Wireless Subscriber Growth (CAGR Percent)



Source: CTIA

The size of the US handset market along with the requested data is shown in Figure 6.3.

Figure 6.3 FM Radio-Enabled Handsets, 2008 and 2009

Data Requested	2008	2009	Source
US handset sales to end users	47 million	48 million	Gartner, Strategy Analytics, IDC
% FM radio-enabled handsets*	6.0 %	9.5 %	INSIGHT Research
FM radio-enabled handset sales	2.82 million	4.6 million	Calculated

*Note: The number of sets with FM radio chips embedded that have been disabled could not reliably be confirmed. However, it has been confirmed that iPhone 3GS and iPhone 4G have been built with an FM radio capable chip installed that is not presently activated.

Our research indicates that the FM radio-enabled feature was included in more handsets in 2009 than 2008. Based on a review of handsets introduced in 2010, there will likely be more FM radio-enabled handsets in 2010 than 2009.

Broadcom in particular has a popular handset chip with the FM radio feature. We suspect that this feature will be added to the chipsets that many vendors are using. The circuitry probably adds very little to the cost of the chip.

It is also obvious that US carriers are not taking advantage of marketing the FM radio feature to their subscribers.

6.2 FM Radio-Enabled Devices, 2010-2015

INSIGHT's forecast, noted in Figure 6.4, assumes that the handset market is evolving and that the final sale numbers of FM radio-enabled handsets will be based on marketplace forces and actions of the carriers to meet consumer demands. We assume no Congressional mandate to include the feature in cell phones.

Figure 6.4 FM Radio-Enabled Handsets, 2010 to 2015

Data Requested	2010	2011	2012	2013	2014	2015
US handset sales to end users (Millions)	50	51	51	51	51	51
% FM radio-enabled handsets	13.0 %	16.0 %	19.0 %	22.0 %	25.0 %	28.0 %
FM radio-enabled handset sales (Millions)	6.5	8.2	9.7	11.2	12.8	14.3

The US market for handsets is reaching saturation. This means that it will become a replacement market. Net adds to the subscriber base will be relatively small—though end users will replace their phones as they wear out or as they desire new features such as a QWERTY keyboard or a smartphone. Thus there is some growth in 2010 and 2011 and we expect a stable level of sales after 2011.

Since the FM radio chip is relatively inexpensive it is likely to be adopted by many handset manufacturers. Based on the adoption of other telecommunications services we expect that the increase in the penetration of the FM radio feature will be about three percentage points a year. This is actually rather slow for a telecommunications service. Dial-up Internet and residential broadband access both showed increases of about six percentage points a year. Both had considerable interest on the part of the consumer. With little awareness and demand demonstrated from the consumer and little interest from the carrier, it is hard to make the case for rapid adoption of FM radio-enabled handsets with the current marketplace parameters. Therefore three percentage points a year are definitely achievable, consistent with the change between 2008 and 2009 and a reasonable estimate at this point.

We would expect usage of the FM radio-enabled feature to remain rather low since there appears to be little interest on the part of the carriers to promote this feature. However, we must emphasize that the future has not been written. A change in strategy by a major carrier such as Verizon or AT&T would cause a significant increase immediately. Many factors, including better consumer awareness of the potential benefits of FM-radio enabled handsets, political

pressures, and other factors could substantially change the outcomes we have projected.

7.0 Other Recommendations

While many of the recommendations to increase the number of listeners to FM radio-enabled handsets noted below have undoubtedly been considered by broadcasters, they are worth repeating:

- 1) Develop a promotion program with the carriers. There are a variety of ways to do this:
 - 1a) In-store display or cards for specific handset models. The display would contain the instructions on how to access the FM radio application. Carriers could also add “FM radio” as an accepted search string to their web site search capabilities.
 - 1b) Wireless carrier sales rep training. This would need to be coordinated with each carrier. It could be a web site with instructions and video on how to sell the FM radio feature.
 - 1c) Sales Contest – Specific prize for selling the most FM radio-enabled handsets. Again, this would need to be coordinated with the carrier since they have their own objectives on which handsets they want to sell.

- 1d) Follow-up with existing handset owners that have purchased FM enabled handsets. This might be an instruction card and an offer for a free set of headphones.
- 2) FM radio station advertising: pick the top three selling FM radio-enabled handsets and promote the feature with a 15 second spot. Refer the listener to a web site for further instructions on how to activate the feature.
- 3) Promotion with handset manufacturer: work with the handset manufacturer to include headphones and instructions on how to reach the FM radio feature. Try to get it included on the quick start card. See what it would take to get it included on a sticker that is affixed to the outside of the box.
- 4) Include headphones with the handset device. The headphones are required as the FM antenna and in most cases the antenna must be present before the FM radio icon appears in the handset menu. In order to increase usage the handset must be included rather than purchased separately as an accessory. Carriers can also encourage manufacturers to include integrated antennas in the handsets, negating the need for headphones cord to act as the antenna.

APPENDIX

Internet Forums on FM Radio Activation

- 1 <http://tabletschool.blogspot.com/2007/09/nokia-n800-how-to-activate-secret-built.html>
- 2 <http://windowsphonemix.com/htc/how-to-activate-fm-radio-in-touch-pro-2/>
- 3 <http://forums.wireless.att.com/t5/Nokia/Getting-a-Nokia-6085-which-headsets-activate-the-FM-radio/m-p/1430426>