

## Smart Phone reliability: Apple iPhones with fewest failures, and major Android manufacturers not far behind.

**Synopsis:** SquareTrade analyzed failure rates of over 50,000 smart phones covered by SquareTrade Care Plans and found that Apple iPhones had the fewest malfunctions, with Motorola and HTC not far behind.

### **Highlights of the study include:**

- *The iPhone 4 was the most reliable phone, with 2.1% projected to have a non-accident malfunction in the first 12 months. The major makers of Android devices, Motorola and HTC, were also very reliable, with just 2.3% and 3.7%.*
- *BlackBerry and other smart phones were less reliable, with 6.3% and 6.7% failing in the first 12 months of use.*
- *Accidental damage is responsible for over 75% of smart phone failures. BlackBerry devices had the lowest one-year accident rate at 6.7%, and the iPhone 4 had the highest at 9.4%.*
- *The iPhone 3GS had the lowest overall failure rates, with just 11.7% failing over the course of a year, and the aggregated pool of other smart phones had the highest failure rate at 16.9%.*

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## Introduction

SquareTrade last compared smart phone reliability in November of 2008, back when the BlackBerry, Apple's iPhone 3g and Palm Treo dominated the smart phone market. In the brief history of mobile phones, that was eons ago. While BlackBerry is still the overall leader with 31% of the U.S. market according to recent Nielsen data<sup>1</sup>, the real story is the meteoric rise of Google's Android platform. 2011 is shaping up to be an epic battle, with Android and iPhone vying for overall dominance of the market. Together these 3 operating systems now account for 78% of the Smart Phone market.

In this report, SquareTrade compared the failure rates of iPhone, BlackBerry, and the 2 major Android phone manufacturers (Motorola and HTC), as well as an aggregated pool of all other smart phones. We analyzed customer reported failure data from a sample of over 50,000 new mobile phones, and looked at accidents separately from normal malfunctions.

We found the iPhone 3gs and BlackBerry to have the lowest overall failure rates of the bunch, with 11.8% and 13% reporting a failure over the first 12 months of use. The major Android phone manufacturers and the iPhone 4 all failed at similar rates, with 14.5% to 15.9% projected to fail over 12 months.

Overall, the four major smart phone manufacturers we looked at individually fared better than smart phones made by other manufacturers. On average, 16.9% of other smart phones reported a failure over 12 months.

Now let's delve into the results of our analysis.

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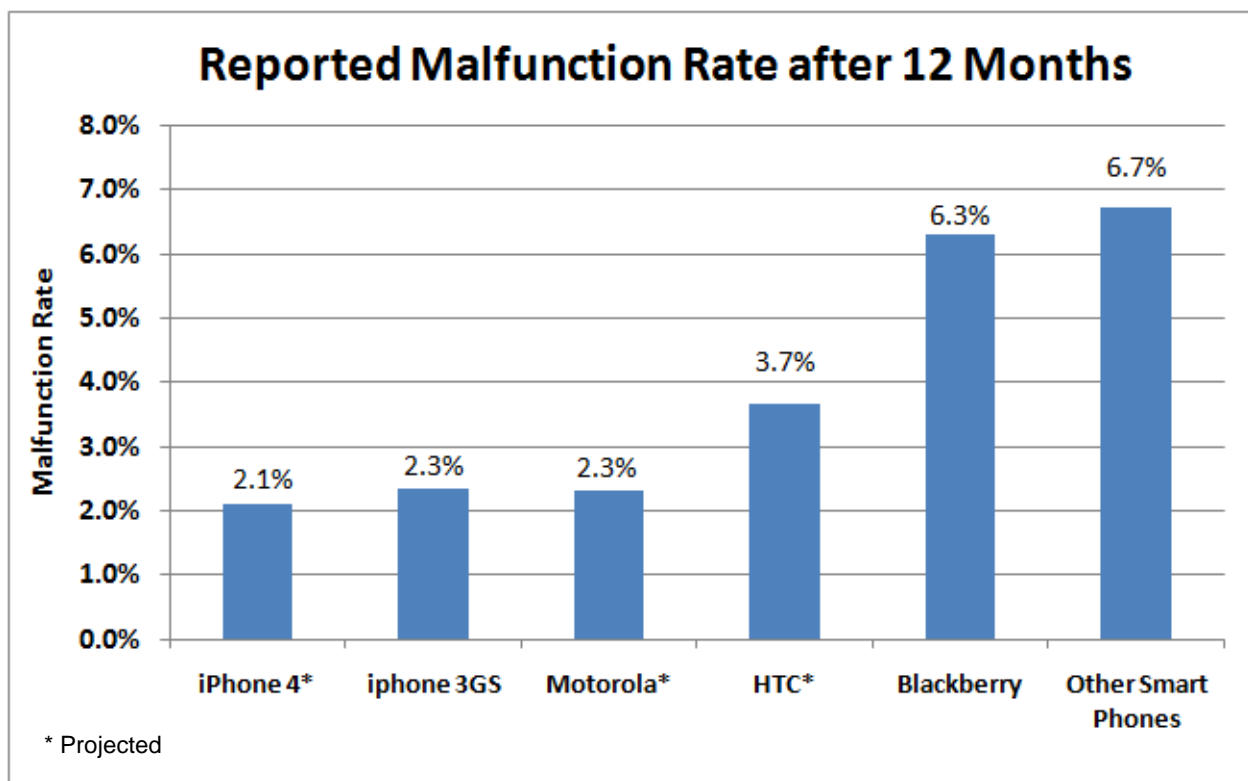
<sup>1</sup> 5-Oct-2010 Nielsen Report: [http://blog.nielsen.com/nielsenwire/online\\_mobile/android-most-popular-operating-system-in-u-s-among-recent-smartphone-buyers/](http://blog.nielsen.com/nielsenwire/online_mobile/android-most-popular-operating-system-in-u-s-among-recent-smartphone-buyers/)

## Smart Phone Reliability: Good Overall

To arrive at overall failure rates, we looked at and combined both types of failures, accidents and normal malfunctions. We first examined the malfunction rates, to compare the relative product reliability of each manufacturer when an accident isn't involved.

Given that Android phones really started gaining traction in 2010, we have 8 months of solid data for Motorola and HTC, and 4 months of data for the iPhone 4, which launched in June of this year. Using this data, we predicted the 12 month failure rates using the failure curve for other phone models. We used the actual 12 month data for BlackBerry, the iPhone 3GS, and other smart phones. For a list of the phones included in the study, please see the Appendix below.

Figure 1. Reported Malfunction Rate



Apple emerged as the most reliable manufacturer, with Motorola not far behind. We project fewer than 2.5% of iPhone and Motorola owners will report a malfunction in the first 12 months of use, with iPhone 4s leading the pack. HTC came next with a one-year malfunction rate of 3.7%, and BlackBerry's 6.3% was the highest of the four manufacturers examined. All other smart phones taken together fared the worst, with 6.7% reporting a malfunction.

While BlackBerry's failure rate is relatively high, it's worthwhile evaluating in context of their failure rates 2 years ago, when SquareTrade last analyzed smart phone failure rates. In SquareTrade's November 2008 study<sup>2</sup>, BlackBerry had a 11.9% first year malfunction rate, and iPhones had a 5.6% malfunction

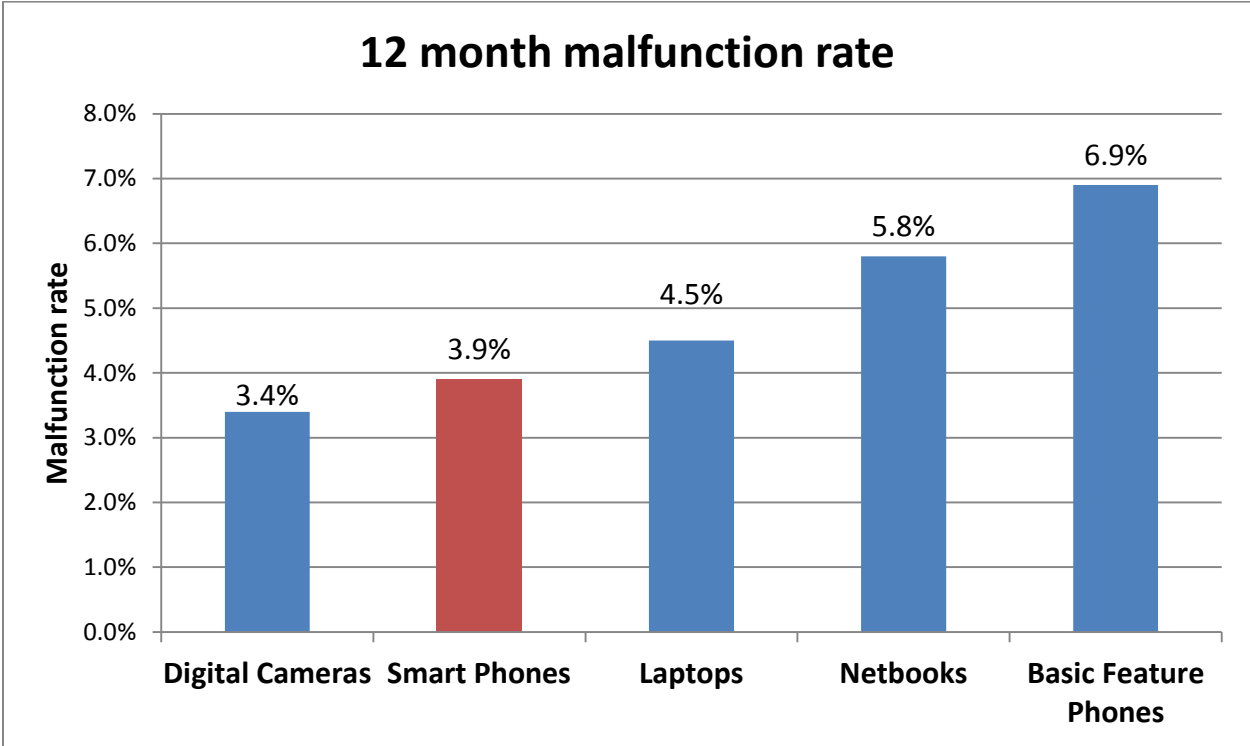
<sup>2</sup> [http://www.squaretrade.com/htm/pdf/SquareTrade\\_iPhone\\_Study\\_1108.pdf](http://www.squaretrade.com/htm/pdf/SquareTrade_iPhone_Study_1108.pdf)

rate. This means that both BlackBerry and iPhone malfunction rates have dropped by half or more in two years, a pretty impressive feat.

Modern smart phones have really only been around since 2006 or so, and this dramatic improvement in reliability suggests that manufacturers have largely solved the hardware problems that plagued earlier smart phone technologies.

The 3.9% average malfunction rate makes smart phones more reliable than many other categories of portable electronics, as shown in Figure 2:

Figure 2 Malfunction rates of common portable electronics

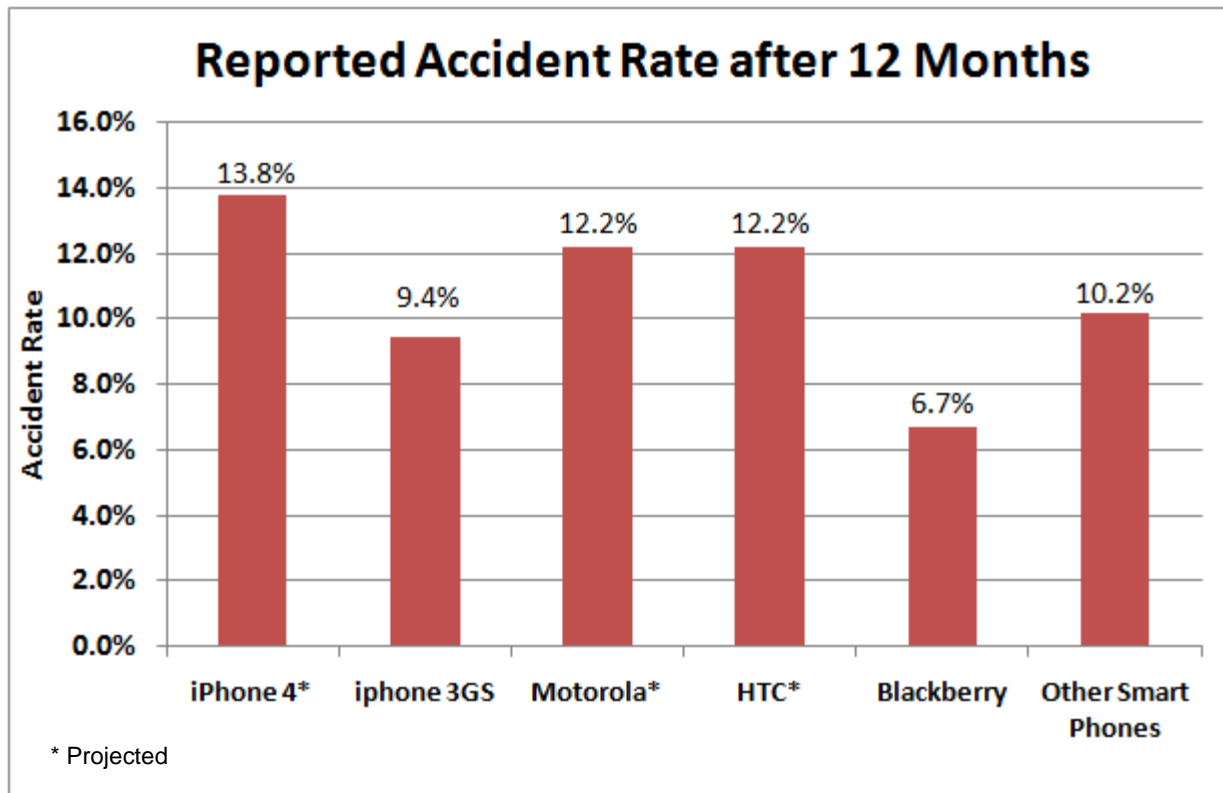


Next, we looked at accident rates for smart phones.

## Smart Phone Durability – Accidents Happen!

Today's smart phones see more use and abuse than any other portable electronic device in history. One would be hard pressed to find a single owner who has never dropped their phone. This issue deserves plenty of attention, especially with the growing popularity of full glass panels on both Android and BlackBerry phones. We first examined the overall accident rates:

Figure 3. Reported Accident Rates after 12 months



The BlackBerry fared best here, with just 6.7% reporting an accident in the first year. The iPhone 3GS was the only other phone to have an accident rate of less than 10%.

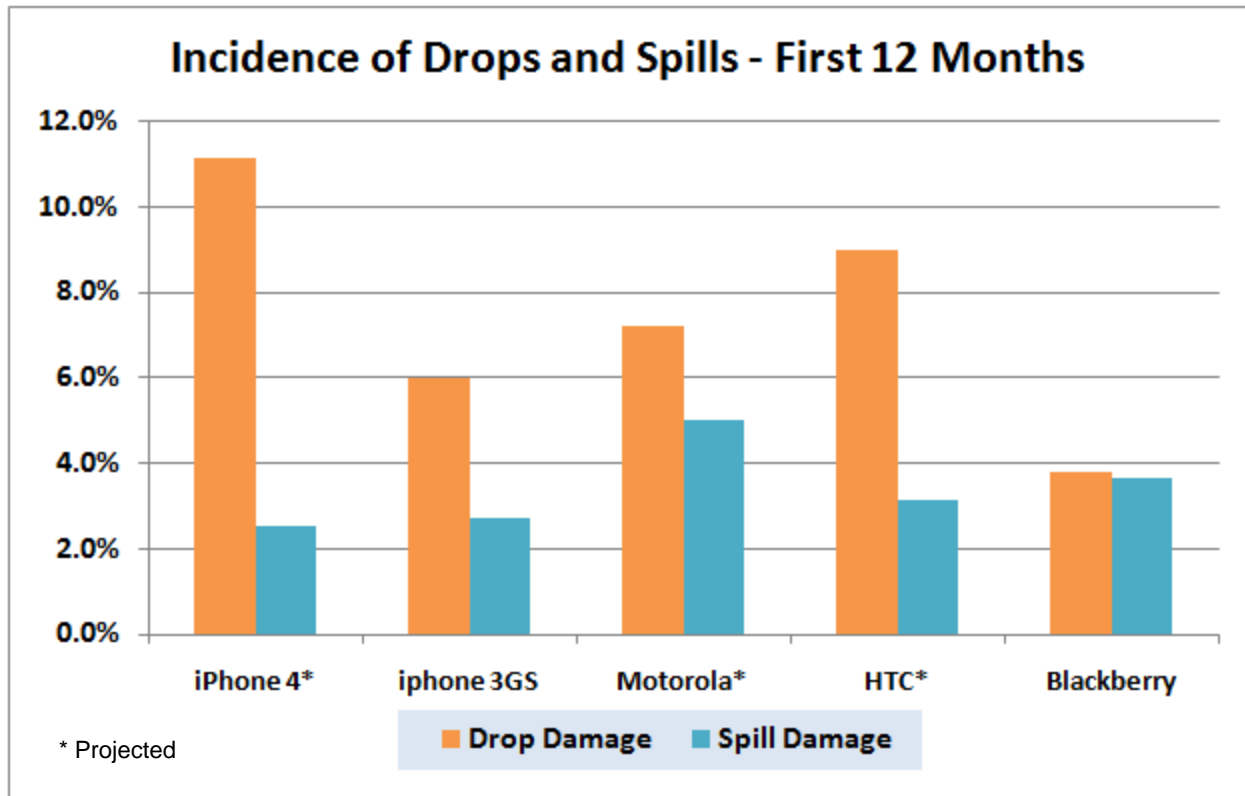
As reported in our previous study on the iPhone 4 glass<sup>3</sup>, the early iPhone 4 data shows a much higher accident rate compared to its predecessor. However, when we compare it to the Android manufacturers, it is higher, but not by much. We expect 13.8% of iPhone 4 owners to report an accident within a year, compared to 12.2% for both Motorola and HTC.

<sup>3</sup> [http://www.squaretrade.com/htm/pdf/SquareTrade\\_iPhone4\\_Study\\_1010.pdf](http://www.squaretrade.com/htm/pdf/SquareTrade_iPhone4_Study_1010.pdf)

## Incidence of Drops vs. Spills

We next drilled down into the two main reported causes of accidents, drops and spills. Unsurprisingly, drops are responsible for most accidents – 77% to be precise. Figure 4 shows the accident rate break out:

Figure 4. Incidence of Drop and Spill Damage in first 8 months of ownership



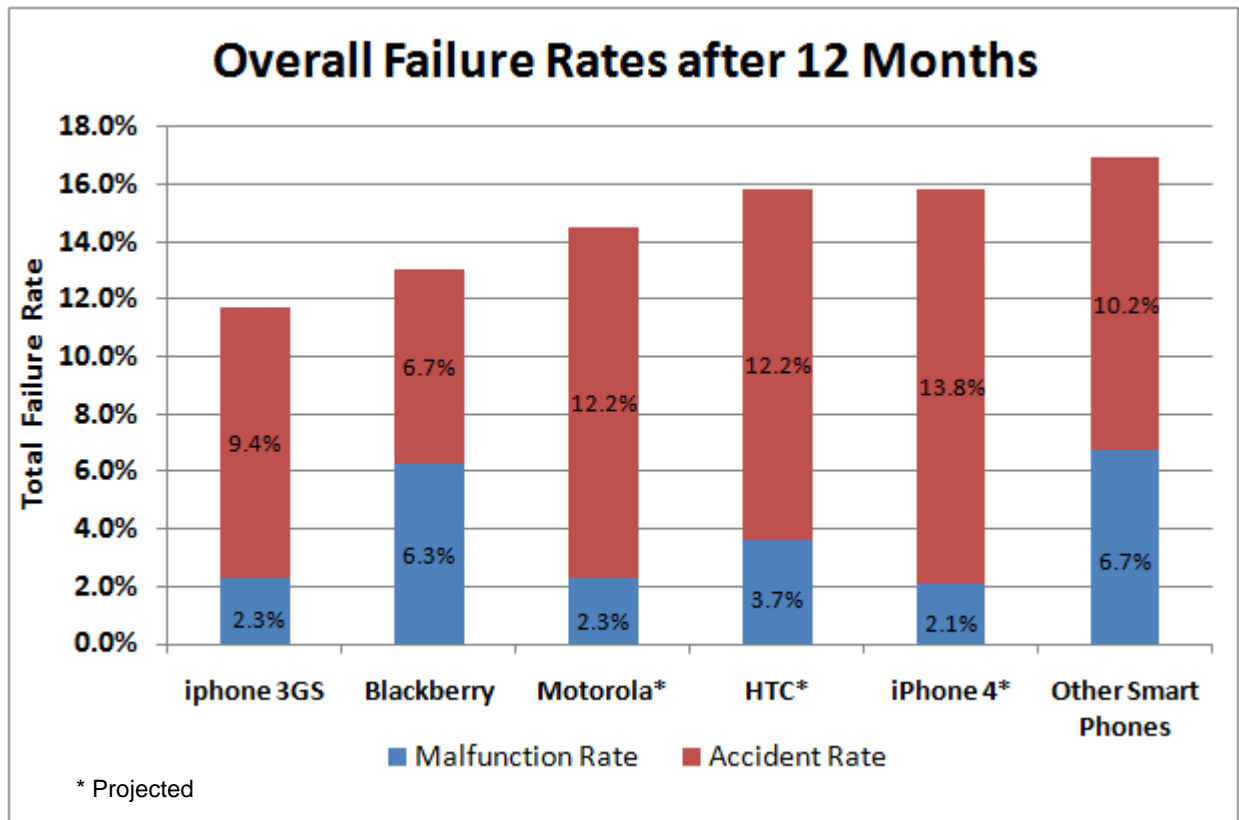
BlackBerry's resistance to damage from drops explains why it has the fewest accidents overall. The iPhone 4 is the most fragile device, and we expect 11.1% to experience drop-related damage over a year, nearly three times the rate of BlackBerry.

The data seems to suggest that the likelihood of drop damage is directly proportional to the amount of glass on the device. With dual-sided glass, the iPhone 4 has twice the fragile surface area of the other smart phones. Both Motorola and HTC, whose most popular phones feature full glass screens, also have higher than average drop damage rates.

At the other end of the spectrum, the average BlackBerry device has both the smallest screen and the lowest rates of drop damage. Of course, correlation is not causation, and there are numerous external factors like protective case use, but the data seems to support the fairly obvious observation that glass breaks much more easily than plastic.

## Overall failure rates

Putting together the malfunction and accident rates, we arrived at overall failure rates. Along with our actual 12 month data for the iPhone 3GS, Blackberry, and other smart phones, we projected the 12 month data for Motorola, HTC, and the iPhone 4.



Once both malfunctions and accidents are taken into account, the playing field levels out a bit. The iPhone 3GS is the least likely to experience failure, with BlackBerry not far behind. Motorola phones, HTC phones, and the iPhone 4 failed slightly more often, but none are projected to exceed a 16% failure rate.

The aggregated group of other smart phones had the highest failure rates, with nearly 17% of the group failing in the first year. That translates to an overall failure rate 44% higher than the iPhone 3GS.

## Conclusions

SquareTrade's data on smart phones suggest that there is a good deal of variance in the failure rates of different smart phones. The iPhone 4 is the most reliable phone in the study, but also has the highest risk of accidental damage. Blackberrys had the least risk of accidental damage, and may be the best choice for the clumsiest consumers, but had a relatively high malfunction rate.

Unlike other electronics, smart phones are an investment that extend beyond the upfront cost of the device. For starters, nearly all smart phone users are locked into a 2 year contract with their carrier. Moreover, a higher failure rate imposes an extra cost to consumers because the subsidized price of a new phone with contract is much lower than the replacement cost. A broken \$200 camera will cost \$200 to replace if it breaks, but a broken Android phone purchased for \$200 may cost \$600 to replace without a new contract.

Fortunately for consumers, smart phone reliability has improved significantly in the past 2 years, so manufacturer reliability is no longer a big issue in determining failure rates.

The bigger issue for consumers is the vulnerability of phones to accidental damage, especially as the market evolves more and more to include large glass displays. Accidents accounted for 77% of all failures in the 4 manufacturers that we looked at closely, and nearly 90% for the iPhone 4. Some of this risk can be mitigated by the use protective cases and screen covers, especially for devices that have the highest risk of accidents in SquareTrade's study.

Finally, as the smart phone market continues to evolve, we will continue to monitor and report how changes in technology and construction affect future reliability.



## Appendix: Notes about the Data and Methodology Used

For this study, SquareTrade analyzed the failures reported by the owners of SquareTrade warranties. We included only items that were purchased brand new (i.e. not refurbished or used).

Here is a list of the most common models or series of phones included for each manufacturer:

Motorola: Droid, Droid X, Cliq

HTC: Nexus One, Evo, Droid Incredible, Aria, Hero

Blackberry: Curve, Bold, Storm, Torch, Pearl

Other Smart Phones includes phones from Samsung, LG, Palm, Nokia, Sony-Ericsson, and other minor manufacturers.

The following disclaimers apply to our data and analysis:

- Only malfunctions reported directly to SquareTrade are included in the data. Other malfunctions, including software/hardware issues handled directly by Apple, problems associated with product recalls, and those fixed by software/firmware updates, may not be represented in this data.
- Android phones have only been around for about a year to a year and a half. Various manufacturers released their first Android phone at various times, so we don't have a full year of data on every manufacturer.
- We defined a smart phone as a device that had a non-subsidized retail price of \$350 or more at time of purchase.
- Phones from any particular manufacturer included in this study are not exclusively Android phones.
- This study only includes phones sold after January 2008, for all brands.

### Limitations:

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