



The Mobile Economy North America 2014



GSMA Intelligence

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Executive Summary

The North American region is home to a vibrant and successful mobile industry, which has seen the rapid adoption of both new technologies and innovative new services; and with high levels of consumer usage and low effective retail fees compared to other developed markets. The United States (US) is the world's largest 4G market and the region has the world's highest rates of smartphone adoption, whilst North America is firmly at the centre of the new and rapidly evolving mobile ecosystem. The mobile industry in North America is on the leading edge of innovation and remains a key driver of economic growth.

Consumers in North America use significantly higher volumes of mobile services compared to users in other developed markets, whether looking at more traditional services such as voice and SMS, or at mobile data, where the region is seeing strong growth. The US market, and to a lesser degree the Canadian market, are characterised by high usage volumes and low retail fees compared to many other developed markets, especially those in Europe.

The North American region is embracing the 4G data revolution and seeing a rapid migration to higher speed networks. Since the launch of the first LTE networks in the third quarter of 2010, operators have been transforming their device portfolios and data tariffs to take advantage of the opportunities around higher speed data services, with network coverage close to 97% of the population by the end of 2013. The US had 85 million 4G connections¹ at the end of 2013, as many as the next four markets combined.

Operators in the region have successfully monetised the strong growth in data volumes: helped by the introduction of tiered pricing and shared data plans. North America is the only region to have seen broadly stable average revenue per user (ARPU) over recent years, at a time when ARPUs in Europe and other developed markets have been under pressure.

These trends have allowed operators in the region to deliver healthy revenue growth over recent years. Over the period 2008-2013, revenues in North America grew at a compound annual growth rate (CAGR) of 4.7% per annum, slightly above the global average figure of 4.5%. This was well ahead of the outcome in Europe, where revenues declined at a CAGR of 3% per annum. Going forward, growth is forecast to slow to just above 2% per annum out to 2020. While revenues from more traditional services are under pressure, operators are also looking to grow revenues from a range of new services and applications.

1. Excluding M2M connections

The forecasts for slowing revenue growth reflect a number of factors, including market saturation (with signs that smartphone sales are now beginning to slow) and increased competition. Whilst the US market has been dominated in recent years by two larger operators, there are indications that competition has increased in the US mobile market over recent quarters. T-Mobile, in particular, is looking to refresh its brand and regain momentum with a range of new offers and tariffs, with the potential for price cuts to reduce revenue growth in a relatively highly penetrated market.

The growth of the mobile industry and the broader ecosystem in the region is built upon the investments of the mobile operators, as seen particularly in the rapid deployment of near ubiquitous mobile broadband networks. Operators need to invest to update networks, acquire spectrum and fund research, with capital expenditure by operators in the region totalling over US\$175 billion over the last six years. With almost a further US\$260 billion of capex forecast out to 2020, these investments depend on the ongoing health and profitability of the operators across the region.

North America's mobile industry has benefited from a generally supportive regulatory backdrop that has played an important role in its strong performance in recent years. For example, the US market saw the early allocation of digital dividend spectrum, whilst a strong secondary market in spectrum allowed operators to transfer licences with minimal oversight and delay. In addition, regulators in the US have taken a more *laissez faire* approach to consolidation, certainly as compared to the situation in Europe. Between 2003 and 2012, the Federal Communications Commission (FCC) approved 20 significant mergers and other mobile licence transactions, with a total value of US\$288 billion. It is noteworthy that the FCC justified its decision to approve the 2013 merger of T-Mobile and MetroPCS in part on its finding that the merger will "enable the deployment of a substantial LTE network nationally".

The mobile industry (both directly and indirectly) contributed around 3% of gross domestic product (GDP) in 2014 in the region, equivalent to around US\$550 billion. This figure is expected to increase to around US\$620 billion by 2020. In addition, there were around 1.1 million direct jobs supported by the mobile ecosystem across the region, with a further 380,000 supported indirectly. The mobile ecosystem also made a direct contribution of over US\$63 billion in public funding in 2013, even before considering regulatory and spectrum fees. The 700MHz auction in Canada earlier this year raised nearly US\$5 billion.

North America is at the centre of a new and rapidly developing mobile ecosystem. The region is playing a leading role in the development of new services and applications that have seen global take up. Operating systems originating in North America have come to dominate the global smartphone market, reaching 94% of total smartphone sales in 2013. The availability of high speed networks and strong smartphone uptake have created a virtuous cycle as consumers rapidly adopt new mobile technologies, applications and services.

The broader mobile ecosystem in North America is home to a number of global internet companies that are key drivers of innovation. These companies have had a significant impact on the mobile and internet industries not only in North America but also across the world. The US remains the largest single market for app downloads, with data from Appnation suggesting that the app economy in the country was worth over US\$72 billion in 2013, a figure that is forecast to more than double by 2017.

North America is one of the world's leading regions for digital commerce, with mobile advertising reaching almost US\$10 billion in 2013 (over half the global total). Additionally, mobile commerce purchases on smartphones and tablets totaled over US\$114 billion in 2013, fuelled by the rapid adoption of these devices.

The Internet of Things has the potential to deliver innovative new services and solutions, whilst looking to address key challenges that face all global regions including congestion, climate change as well as delivering better and more cost effective healthcare and education systems. North America is home to a large number of M2M connections, with the US the second largest market globally behind China and with connections forecast to grow at a rate of 21% per annum out to 2020. The region is seeing a growing number of new service deployments, in both the consumer and business markets. In the consumer segment, several operators already offer security and home automation services, such as Verizon's Home Monitoring and Control and ATT's Digital Life.

North America is one of the world's largest automotive markets, as well as being home to a number of leading auto manufacturers. Not surprisingly, the region is already the world's largest in terms of connected car revenues. With LTE networks already well built out in the US, operators are leading the way in deploying 4G M2M connections, which allow improved interactivity and more advanced data analytics. An example is AT&T's partnership with GM to offer OnStar services from 2015.

Mobile health has gained particular traction in North America, with the region at the forefront of deployments. Remote monitoring of patients is a particular opportunity given the scope to significantly reduce costs in a region with the world's most expensive health system. A number of operators have launched services in this area, including SaskTel, Verizon and AT&T.

The success of the North America mobile industry and the emergence of a number of globally dominant internet giants and innovative new application and service providers has been helped by the collaboration and cooperation between all major players in the region. This includes cooperation between the mobile operators and other ecosystem players; as well as through collaboration with governments, regulators and other industry stakeholders. This highlights the importance of collaborative action if both mobile operators and new entrants to the ecosystem are to meet the needs of customers in the future.



The US is the world's largest
4G MARKET
and the region has the world's
highest rates of smartphone
adoption.

MOBILE ECONOMY NORTH AMERICA

Unique subscribers and SIM connections



*Excluding M2M

Leading the world in the move to 4G and smartphone adoption



60%

Smartphones accounted for over 60% of connections in North America at end of 2013



Rapid migration to higher speed networks with 4G close to a third of connections by mid-2014

Data traffic growth and high usage levels fuelled strong revenue growth

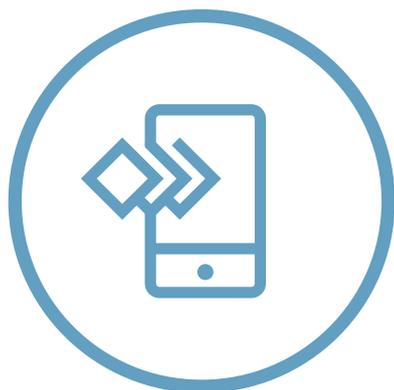


High levels of mobile usage compared to other regions



Operator revenues grew at CAGR of 4.7% 2008-13
Revenues forecast to grow at a CAGR of over 2% 2013-20

At the centre of a new and rapidly evolving mobile ecosystem



Operating systems from the region dominate global smartphone sales



Leading market for digital commerce. Mobile commerce purchases on smartphones and tablets totalled **US\$144B** in 2013

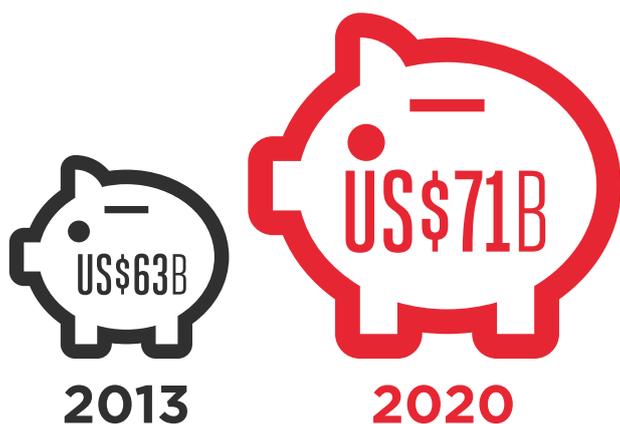


US is second largest market for M2M connections and is seeing a range of new deployments with significant growth potential

Mobile ecosystem contribution to GDP in North America



Public funding



Mobile ecosystem contribution to public funding In North America

Employment



1.5 million jobs supported directly and indirectly by the mobile ecosystem in 2013

North America: A vibrant and successful mobile industry

1.1 Subscriber growth stalling

The North American market had 250 million unique subscribers at the end of 2013, equivalent to a penetration rate of 70% of the population. At the same time there were a total of 341 million connections² (i.e. SIM cards), equalling a penetration rate of 95%. The number of SIM connections was higher than the number of unique subscribers due to the prevalence of multi-SIM ownership in the region.

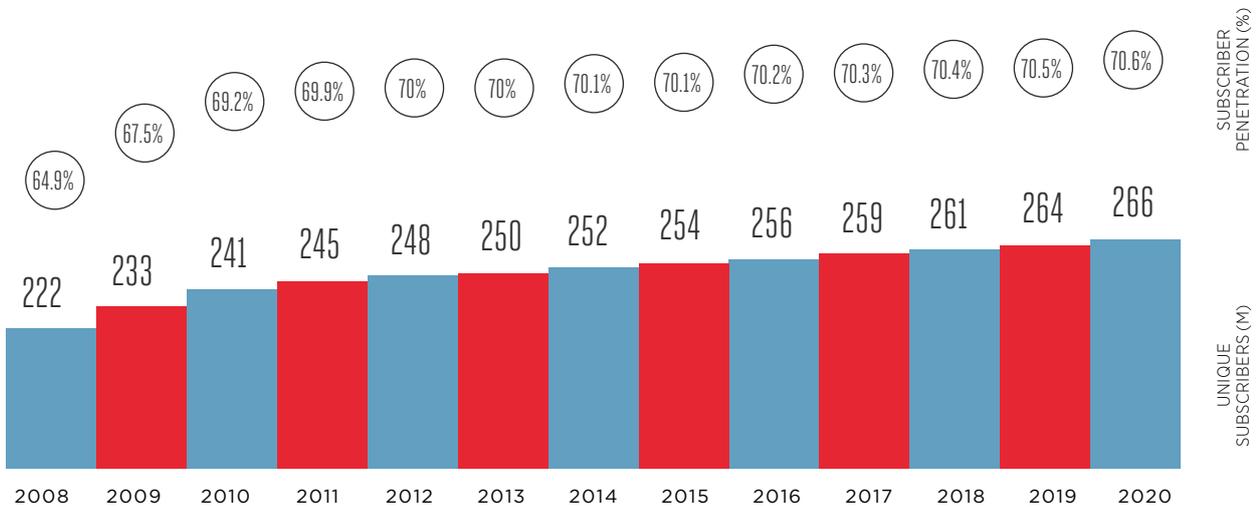
Unique subscriber growth rates have stalled in the region over recent years, having reached the 70-80% threshold at which growth tends to stall in developed

markets. While the total number of individuals who have subscribed to a mobile service grew at close to 2.5% over the period 2008-13, over the next seven years total subscriber numbers are forecast to grow at less than 1%.

There is a similar outlook for the total number of connections in the region, which are forecast to grow at just over 2% over the period out to 2020. This is less than half the growth rate of the preceding five years.

Source: GSMA Intelligence

Unique subscribers and penetration rates



2. Note that this figure excludes the number of M2M connections, which are disclosed separately

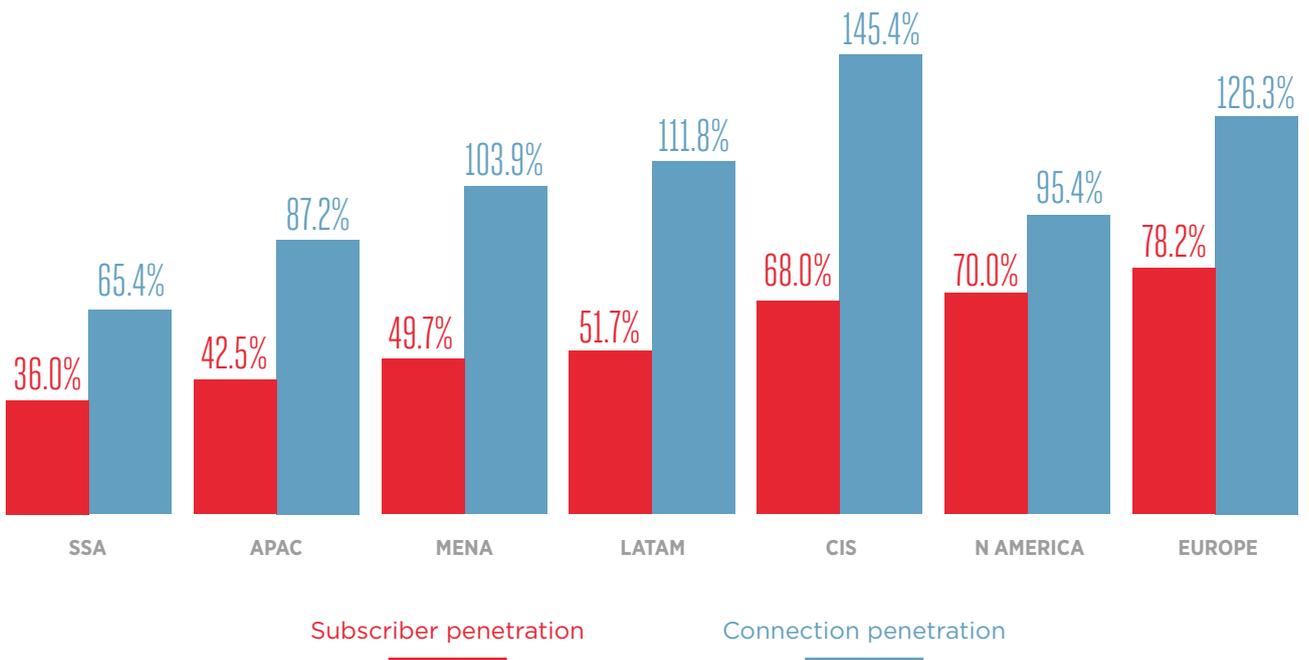


Subscriber penetration rates in North America are above the global average, but below both the European and developed market average figures of around 79% each. The same is true for connection penetration rates, where the rate of 95% at the end of 2013 trails behind the average in several developed and developing regions. These include Europe, the Commonwealth of Independent States (CIS) and Latin America (LATAM).

Source: GSMA Intelligence

Unique subscriber and connection penetration by region

2013



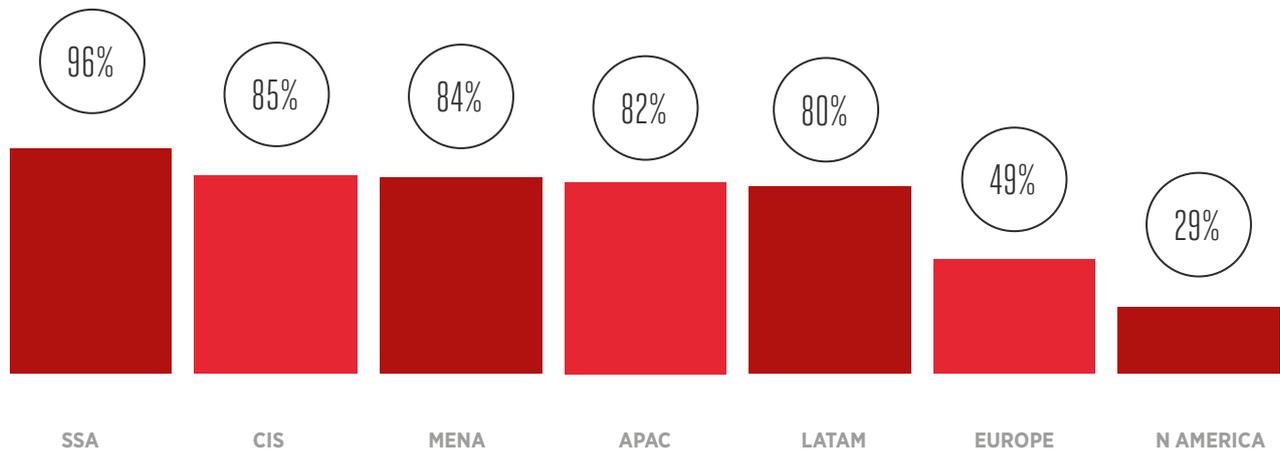
1.1.1 A largely contract based market

Lower penetration rates in North America reflect a number of factors, though the dominance of contract tariffs in the US market is a major driver. North America has the lowest proportion of prepaid tariffs in the connection base of any global region. Whilst affordable prepaid contracts have been an important factor in driving penetration rates in emerging markets, they have also been a feature of a number of more developed markets, including in Europe.

Source: GSMA Intelligence

Prepaid percentage of total connections

2013

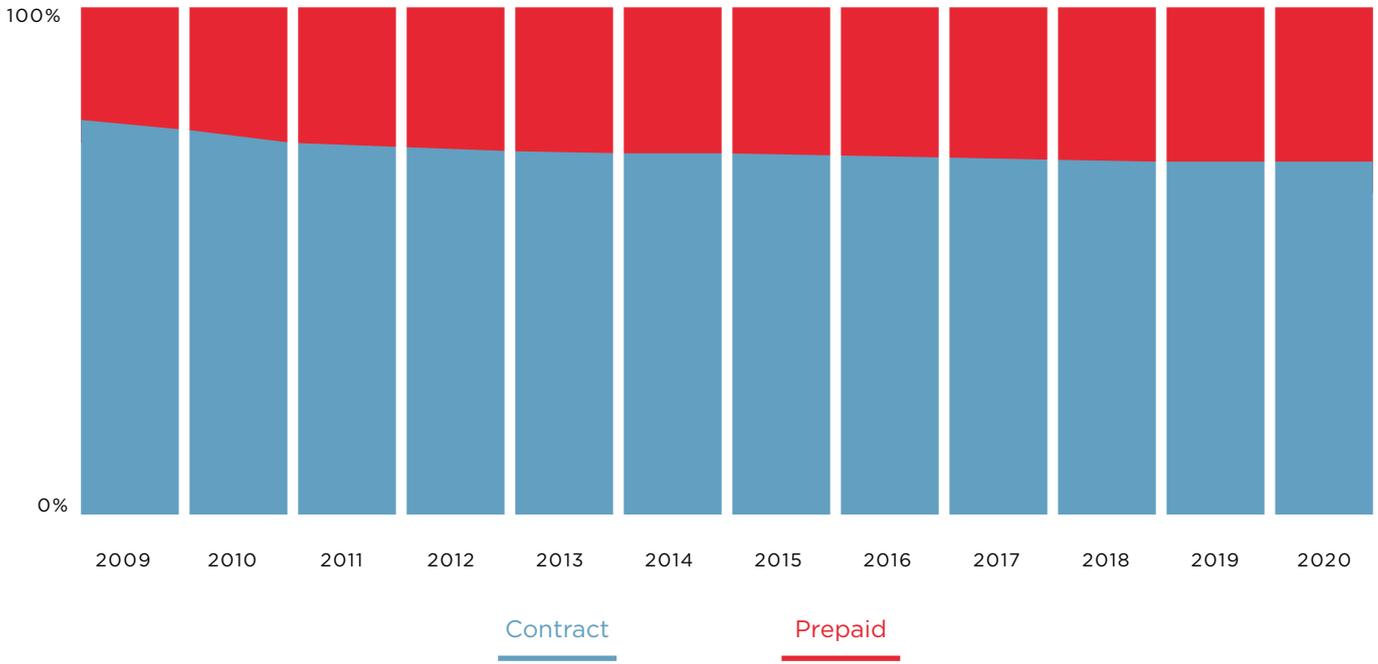


A key factor in the US compared to other markets was the historic dominance of the ‘receiving party pays’ model, also referred to as “bill and keep”. This is where the person receiving a call is charged, although operators themselves do not pay for the interconnection of calls between themselves. Historically, this proved a disincentive for subscribers to have their phones on, which led to the increasing adoption of large ‘bucket’ tariff plans that included considerable amounts of voice minutes and text messages for a flat fee. As a result, the US market (and to a lesser degree the Canadian market) has become increasingly characterised by high usage and low retail fees compared to many other developed markets, especially those in Europe.

The proportion of prepaid subscribers in the region did rise in recent years, reflecting both an increased focus by operators on this segment and the impact of some regional operators (such as MetroPCS) and a number of MVNOs. However, progress has stalled over the last couple of years, with the increasing uptake of smartphones and consumer preference for subsidised devices on contract tariffs a likely factor. Going forward the proportion of prepaid tariffs is expected to increase, reaching 31% by 2020, compared to the developed market average of 35%.

Source: GSMA Intelligence

Contract/ prepaid connection split in North America



A related outcome of North America being a largely contract driven market is that the phenomenon of multiple SIM ownership is less common in the region than in more developing markets. Whilst the global average for the number of SIMs per user is two, in North America the figure is only 1.4. However, the growth of mobile broadband devices such as tablets, dongles and routers is leading to an increase in multiple-SIM ownership in more developed markets, including those in North America.

1.1.2 Limited impact from MVNOs in North America

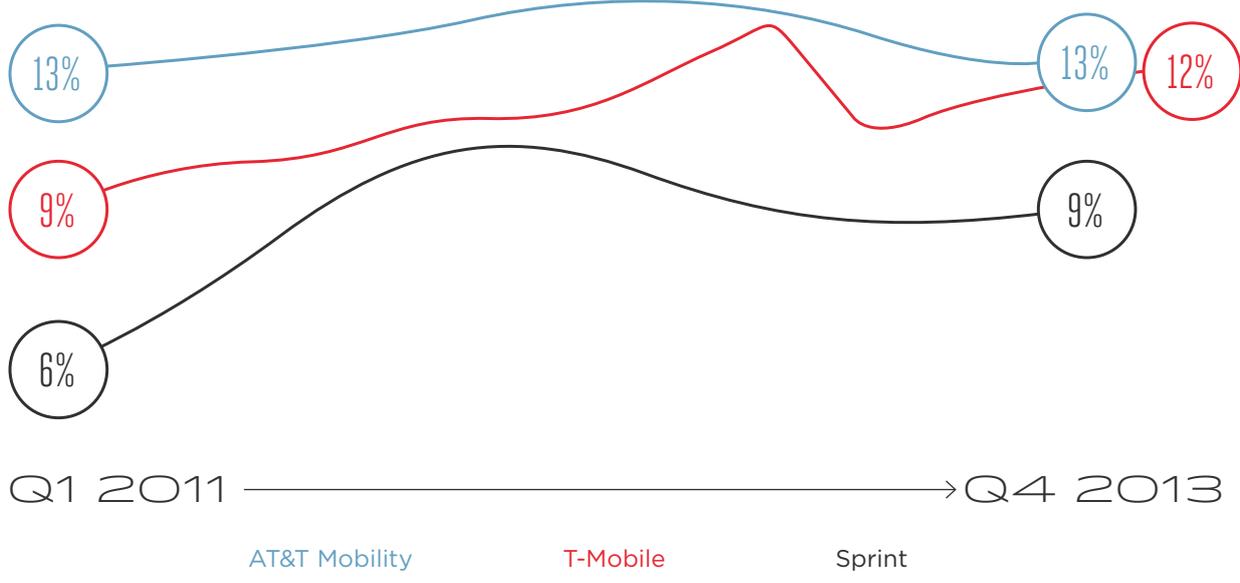
As highlighted in recent research by GSMA Intelligence³, North America is home to a number of both mobile virtual network operators (MVNOs) as well as mobile operator sub-brands. MVNOs tend to be most common in markets where connection penetration is around 100%, as is the case in the North America region.

GSMA Intelligence has identified eight different categories of MVNOs, the most common of which in North America are the 'discount' MVNOs. These discount MVNOs are focused on offering low cost services and allow larger operators groups to target low-value consumer segments, without diluting their core brand or pricing strategies. For example, Sprint currently hosts around 27 of these discount MVNOs (up from 18 in 2012); AT&T has 16 (also up from 13) and T-Mobile and Verizon both have six. Most of these discount MVNOs in the region are prepaid focused.

MVNO connections grew strongly in the US market in 2011, generating more than a quarter of AT&T's net additions in the year and almost half of those at Sprint. However, the MVNO momentum has stalled in recent years, a factor that is likely to reflect the increasing focus in the US market on LTE and smartphone adoption (with subsidised devices typically available only on contract tariffs), mirroring the trend seen in other advanced markets such as South Korea. The exception to this trend has been T-Mobile, where MVNOs have continued to be an important source of connection growth, generating almost a third of its net additions in the last three quarters of 2013 (helped by the acquisition of MetroPCS).

Source: GSMA Intelligence

MVNO as percentage of total connections



3. <https://gsmaintelligence.com/analysis/2014/6/the-global-mvno-landscape-201214/433/>

TracFone is by far the largest MVNO in the US market, and offers wireless service through several brands including Straight Talk, Telcel America, Net10 and Safelink. MVNOs have had less impact in the Canadian market, where Virgin Mobile was one of the largest and most successful before being acquired by Bell Canada.

1.2 Subscribers in North America consume high volumes of mobile services

Consumers in North America use significantly higher volumes of mobile services compared to users in other developed markets, whether looking at more traditional services such as voice and SMS, or at mobile data. Large “bucket” plans developed particularly in the US market, in part as a reaction to the bill and keep interconnect model outlined previously. Comparisons of per connection usage levels can be distorted by differing levels of multi-

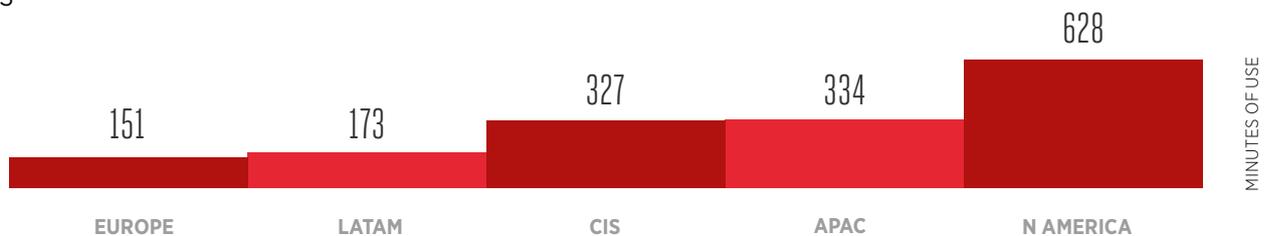
SIM ownership across regions. However, even adjusting for this would still leave usage levels in North America well above most other developed markets.

The following chart shows that minutes of use per connection are substantially higher in North America than any other region, and are almost five times higher than in Europe.

Source: GSMA Intelligence

Minutes of use per connection

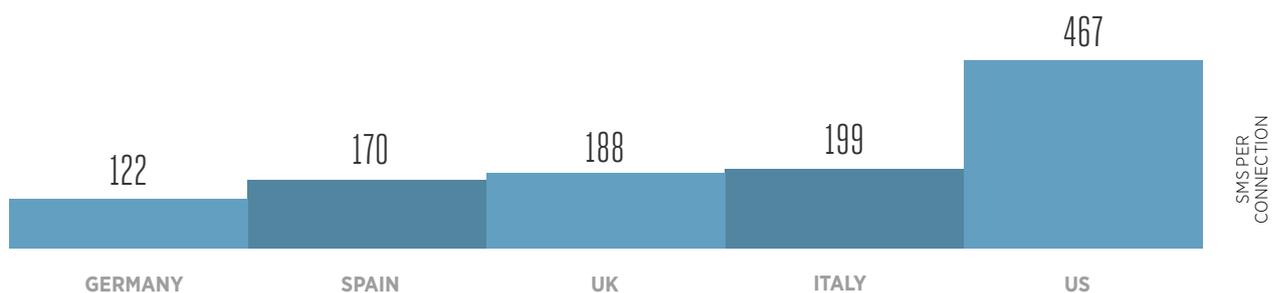
2013



The same is true for messaging services, with SMS volumes in the US market significantly higher than most other developed markets.

Source: GSMA Intelligence, CTIA

SMS per connection in selected markets (per month)

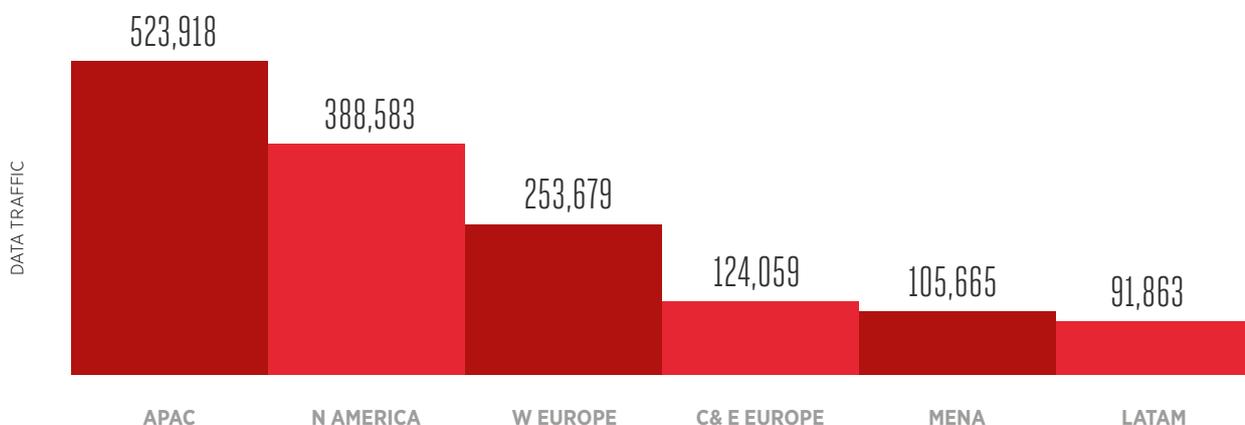


In addition, mobile users in North America consume much higher volumes of data traffic than users in other regions. Data from Cisco indicates that North America in 2013 accounted for over a quarter of global mobile data volumes, despite the region having just over 5% of total mobile connections. Data traffic growth has been fuelled by the rapid move to higher speed networks and high levels of smartphone adoption, as discussed later in this section. This in turn has led to the development of a broad range of new applications and services, many of which are relatively data intensive.

Source: Cisco

Data traffic by region

(PB/month)



As well as operators' business models and tariff plans that compensated for some of the challenges around the bill and keep interconnect model, consumers in North America have also benefited from both the early release of Digital Dividend spectrum and significant investments by the network operators. These factors have allowed the operators to handle large volumes of traffic on their networks.

The US market in particular has seen a significant proportion of households 'cut the cord' and abandon fixed line services. Government data indicated that by the end of 2013, just over two in five US households had mobile only services⁴. Data from OFCOM indicates that the comparable figure for the UK market in 2012 was only 15% of households.

4. <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201312.pdf>

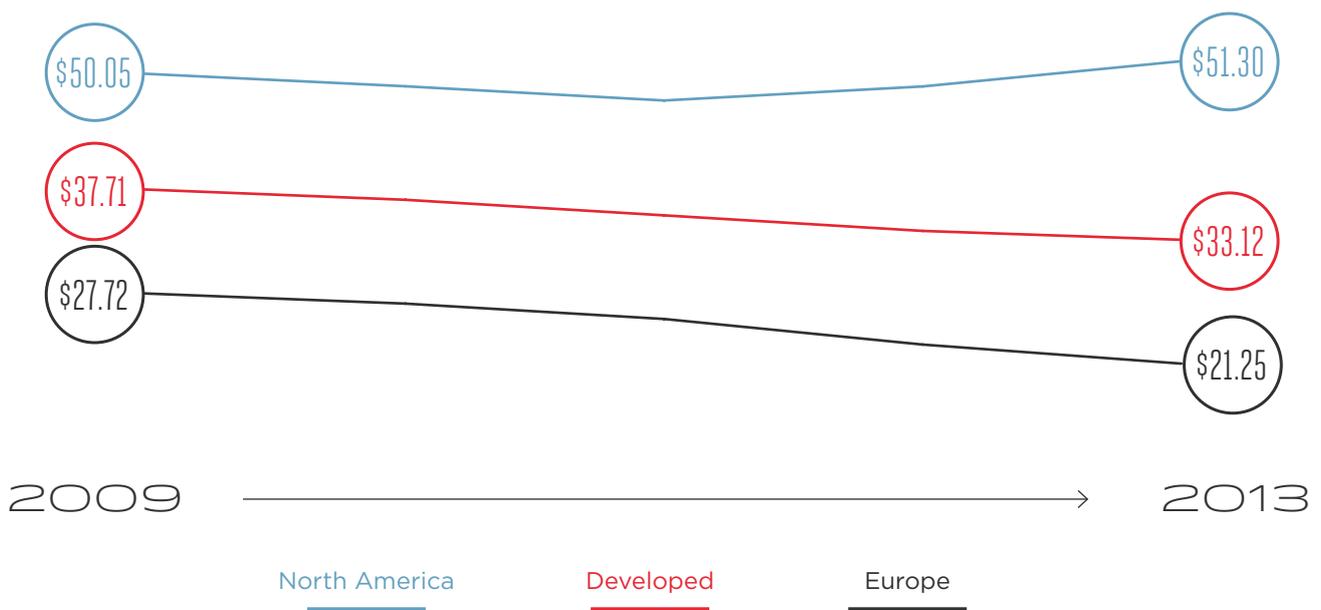
1.2.1 North America also has high ARPU levels

Significantly higher subscriber use of mobile services translates into greater levels of ARPU (revenue per connection) for operators in North America. Indeed, North America is the only region to have seen broadly stable ARPUs over recent years, at a time when ARPUs in Europe and other developed markets have been under pressure. Over the last five years, ARPUs in North America were broadly flat. Over the same period, ARPUs in Europe fell by an average of over 6% per annum, whilst the average decline was over 3% per annum in developed markets.

Source: GSMA Intelligence

ARPU trends by region

(per connection, annual average)



Higher ARPU also reflects both the dominance of the contract model in North America, with contract ARPU typically substantially higher than prepaid. For example, average contract ARPUs for a number of European countries (e.g. the Nordic and Swiss markets) are broadly similar to those in North America, but overall ARPU in Europe is diluted by the large number of prepaid connections. However, a key factor in the ARPU trends in North America over recent years has been the success of the operators in the region in monetising the explosive growth in data traffic.

1.2.2 High levels of smartphone adoption in North America

North America had the highest levels of smartphone adoption of any region at the end of 2013, with smartphones accounting for 60% of total connections by this date. Smartphone adoption has been helped by a combination of higher speed network deployments (particularly the rapid build out of 4G networks over recent years); the dominance of the contract model in the region (whereby consumers can benefit from subsidies for relatively expensive handsets and devices); as well as the broad range of applications and services available to consumers. Operators also rapidly updated their device portfolios (primarily smartphones) after launching 4G services, allowing consumers to take full advantage of the higher speed network capabilities.

In the second half of 2013, a number of operators in the region reported 'record' smartphones sales⁵. Across the 10 Northern American operators that report such figures, smartphone penetration of the contract base grew from 56% in the third quarter of 2012 to 67% in the third quarter of 2013.

There were clear signs that 4G uptake was a key driver of smartphone sales. Steven T. Campbell, US Cellular EVP of Finance revealed during the operator's third quarter 2013 call that "LTE devices [are] about 90 per cent of our smartphones [sold] today", with 4G devices accounting for about 35% (of total devices).

T-Mobile showed the fastest smartphone growth with penetration increasing from 50% to 66% of its contract base. The operator achieved a record 5.6 million smartphone sales in Quarter 3 2013, up from 2.3 million the previous year and equivalent to 88% of total units sold. Sprint sold nearly five million smartphones in Quarter 3 2013, including almost 1.4 million iPhones—of which 40% were sold to new customers. Overall, smartphones accounted for a record 92% of Sprint contract handset sales. In fact, 81% of Sprint's contract handset base now use smartphones, the second-highest among operators which report this metric, after Tele2 Sweden at 83%.

Meanwhile, AT&T sold 6.7 million smartphones in Quarter 3 2013, accounting for a record 89% of its contract phone sales. The operator noted that the

average smartphone data use was growing at a rate of more than 50% year on year, and that it had more than doubled the percentage of customers who are on 10GB plans from 9% to 22%.

There are similar trends evident in the Canadian market. At the end of 2010, Rogers Wireless reported that smartphone users represented 41% of its contract base. This figure had increased to 76% by Quarter 1 of 2014. Bell Mobility saw the comparable figure rise from 28% at the end of 2010 to 74% by Q1 2014.

Whilst the relatively early 4G deployments in North America have contributed to strong smartphone adoption in recent years, the dynamics of the smartphone markets are now beginning to change as developed markets are starting to reach saturation point. This is apparent both at a regional and a global level, with Samsung recently commenting on "a slowdown in overall smartphone market growth".

Data from GSMA Intelligence shows that while smartphones accounted for only 7% of connections in the region at the end of 2007, this had risen to just over 60% by the end of 2013. However, the adoption curve for smartphone is already beginning to flatten. Forecasts suggest that the proportion will stabilise out at around 74% of total connections by early-2018, with only modest increases beyond that date.

5. <https://gsmaintelligence.com/analysis/2013/12/global-cellular-market-trends-and-insight-q4-2013/411/>

Source: GSMA Intelligence

Smartphone proportion of total connections - North America



Both operators and handset vendors have reported challenges in increasing smartphone volumes in recent quarters. Smartphone penetration growth in the contract segment at AT&T Mobility, Verizon Wireless, Bell Mobility (BCE) and Rogers Wireless has been slowing in Quarter 1 2014. To address this issue, operators are increasingly turning to the prepaid market as a source of future smartphone sales.

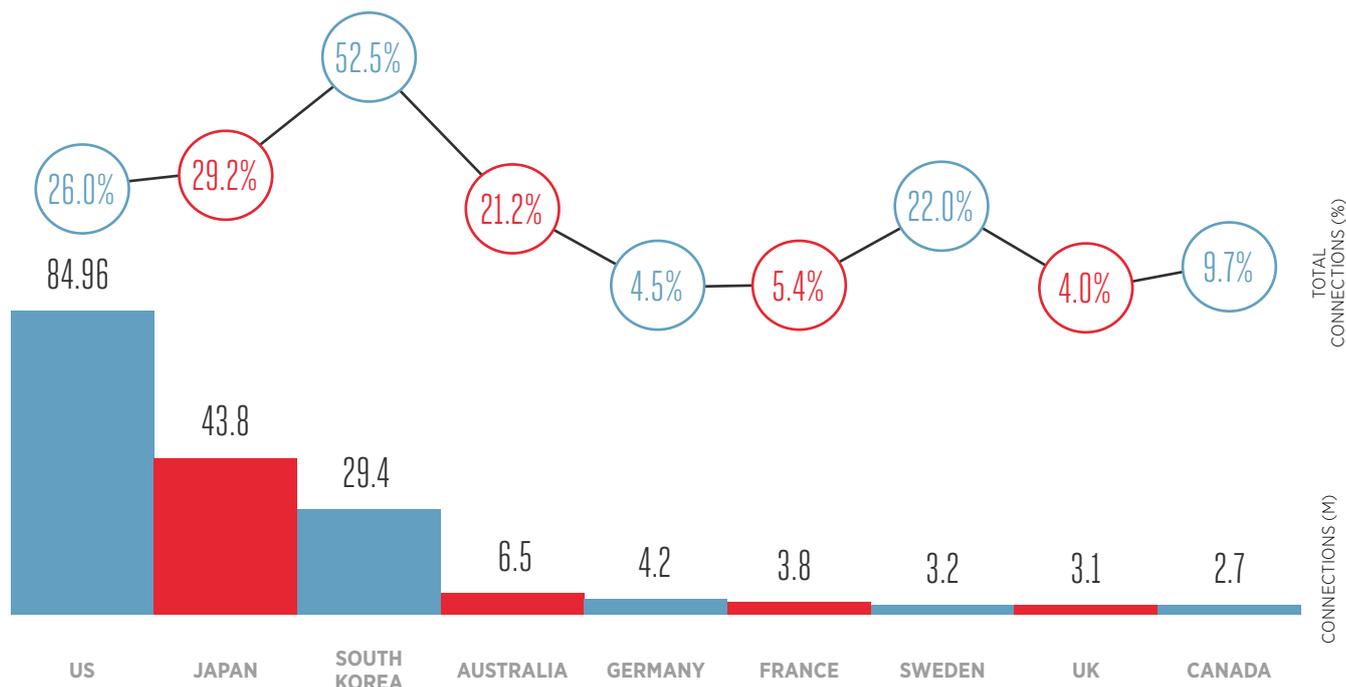
1.3 North America leading the way on LTE adoption

The North American region, and particularly the US market, is embracing the 4G data revolution and seeing a rapid migration to higher speed networks. GSMA Intelligence research has highlighted how, since the launch of the first LTE networks in the US in 2010, operators have been transforming their device portfolios and data tariffs to take advantage of the opportunities around higher speed data services⁶.

The US is the world's largest 4G market, with 85 million connections at the end of 2013, as many as the next four markets combined. In both South Korea and Japan, 4G accounts for a higher proportion of connections, though the US ranks third globally on this metric.

Source: GSMA Intelligence

4G connections by market



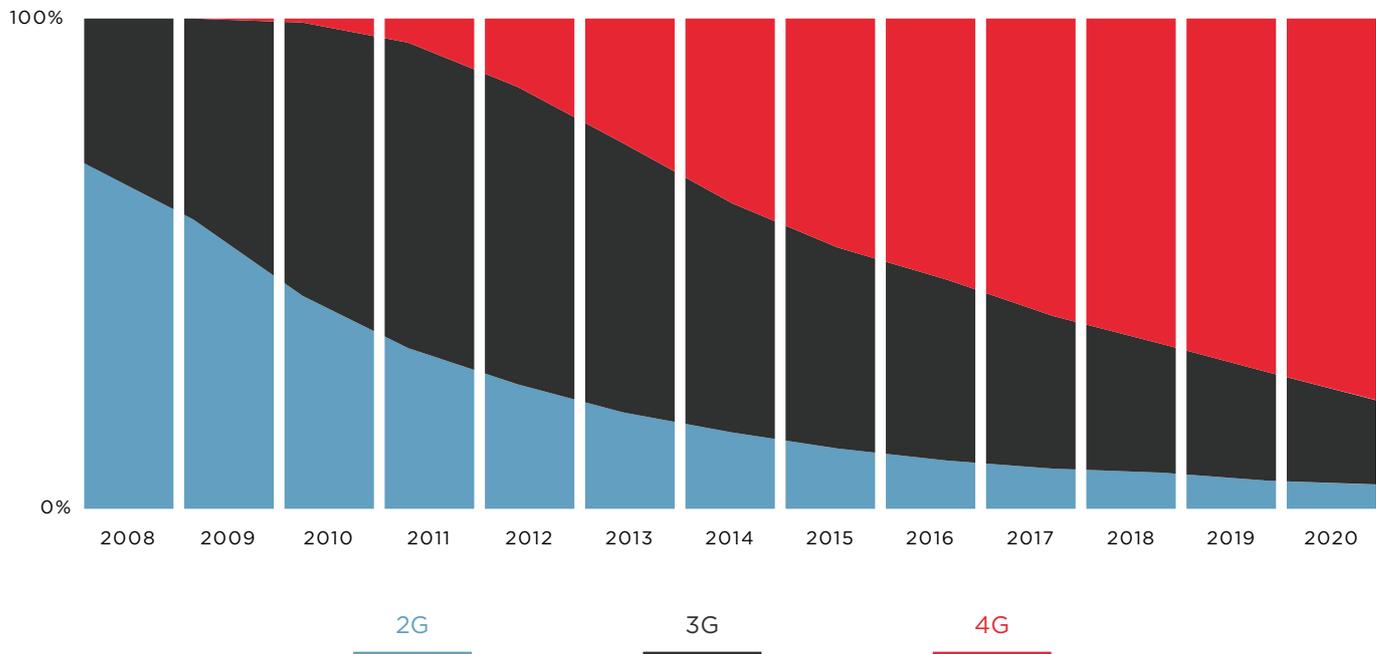
By the end of 2020, the proportion of 4G connections in North America is forecast to reach almost 80%, making it the highest proportion of any region (and compared to the developed market average of around two-thirds).

6. <https://gsmaintelligence.com/analysis/2014/1/how-the-us-is-embracing-the-4g-data-revolution/413/>

Source: GSMA Intelligence

Rapid shift to 4G in North America

(percentage of connections)



The US market has benefitted from the early allocation of the Digital Dividend spectrum in 2008 (in this case the 700MHz band). Operators in the US have followed similar strategies those in other 'Digital Pioneer' markets such as South Korea and Japan. The main elements were as follows:

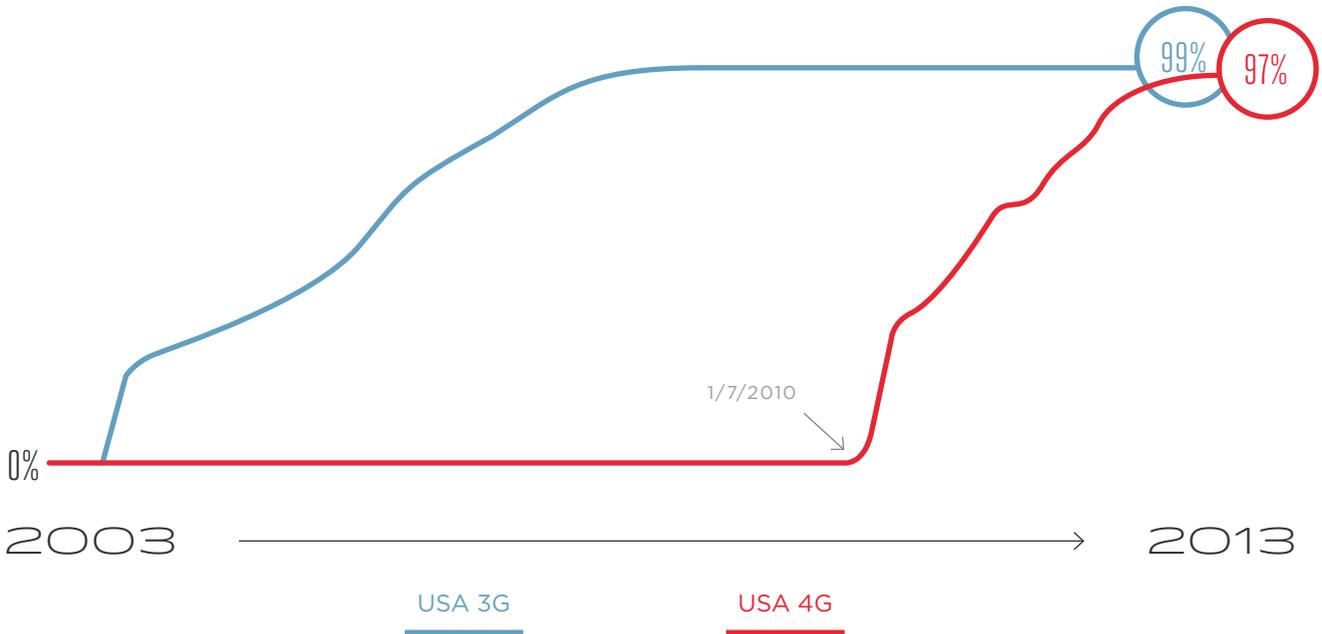
- Rapid network deployment post the early allocation of the 700MHz spectrum in 2008, with several operators claiming near nationwide coverage by the end of 2013. For example, Verizon indicated in January 2014 that it had 'substantially completed' its 4G network deployment, covering more than 99% of its 3G network;

- At the same time, operators moved aggressively to update their device portfolios to 4G compatible devices. At the start of 2014, almost 90% of devices offered by Verizon were 4G-enabled, compared to only around 70% in 2013. Similarly, just under 80% of AT&T devices were 4G enabled at the same date.

GSMA Intelligence data shows that 4G coverage in North America had reached 97% of the population by the end of 2013, one of the highest levels of any global region. It is noteworthy that operators in North America have built out 4G coverage much more rapidly than was the case for 3G. Whilst it took around four years for 3G coverage to reach 95% of the population, 4G has taken just two and a half years.

Source: GSMA Intelligence

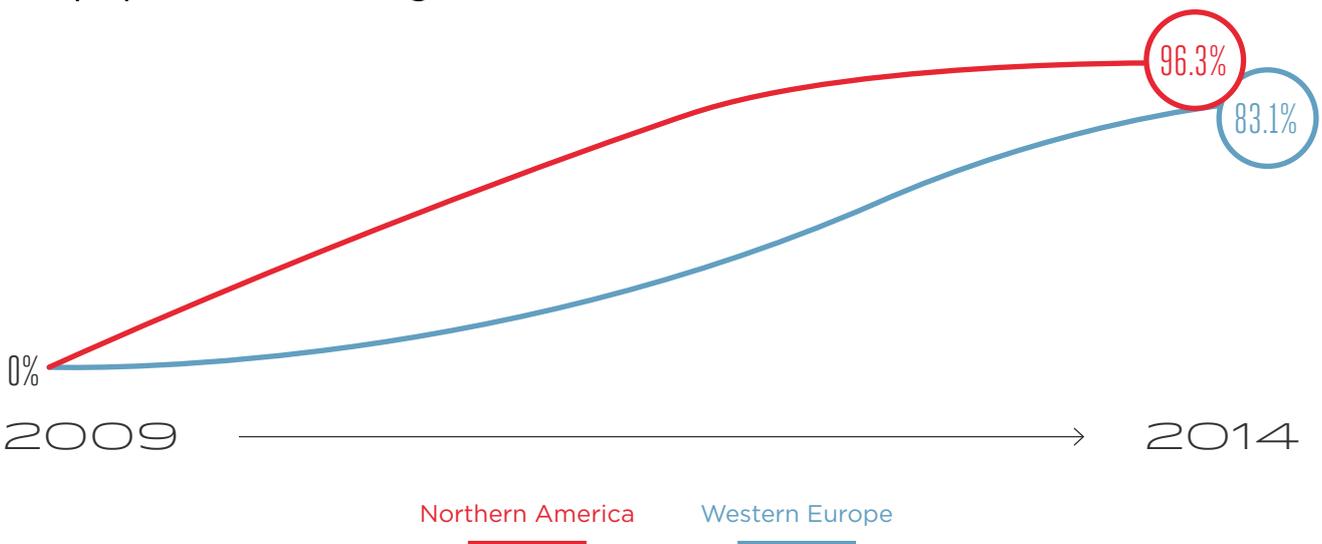
4G versus 3G population coverage US market



Operators in Canada have been slightly slower to build out 4G coverage, though it still reached over 80% of the population by the end of 2013 and should reach 90% by the end of 2014. This is in part due to the later release of Digital Dividend spectrum; but it also reflects the greater geographical challenges in Canada in providing coverage in more remote and rural areas. However, 4G networks across North America as a whole have been built out far more quickly than in Europe.

Source: GSMA Intelligence

4G population coverage



We have already highlighted the strong growth in data traffic in the US market, with it being fuelled by the rapid adoption of 4G devices. For example, Verizon stated in the third quarter of 2013 that its 4G network already accounted for almost two-thirds of its total data traffic. US operators have moved to differentiate their offers and to find ways of monetising this strong growth in data traffic.

The first development on this front was to move away from unlimited data plans and towards 'tiered' data pricing, so that consumers pay more depending on the amount of data they consume. For example, AT&T offers around a dozen different data plans, with pricing ranging from US\$20 for 300MB of data to US\$375 for 50G.

Operators have also introduced shared data plans that allow consumers to use a single data tariff, and the associated data usage, across a number of

devices. In June 2012, Verizon introduced its 'Share Everything' plan, while AT&T launched 'Mobile Share' a month later. As of Quarter 3 2013, Verizon stated that 42% of its contract subscriber base had signed up to a shared data plan. More recently, Verizon has updated its shared data plans and launched 'More Everything' which offers more data for lower prices. This is on the basis that customers sign up for the operator's early smartphone upgrade service.

Shared data plans have encouraged consumers to connect a broad range of data intensive devices to networks in the region, including dongles, laptops and tablets. Combined with the prevalence of tiered pricing, this is leading to a virtuous feedback loop, with increased data traffic (fed by more devices), leading consumers towards more expensive data plans. In turn, this generates higher ARPU and stronger overall revenue trends for operators.

1.3.1 VoLTE now live in the US

Three of the four main US network operators plan to launch voice over LTE (VoLTE) in 2014, which offers higher quality voice calls as well as faster call set-up times. This places the US up with the other leading Digital Pioneer markets (such as Singapore and South Korea) in launching commercial VoLTE services.

T-Mobile has indicated that it aims to have nationwide coverage by the end of 2014. Customers will need to have a VoLTE-compatible smartphone, of which there are only a limited number at present.

1.4 M2M connections seeing strong growth

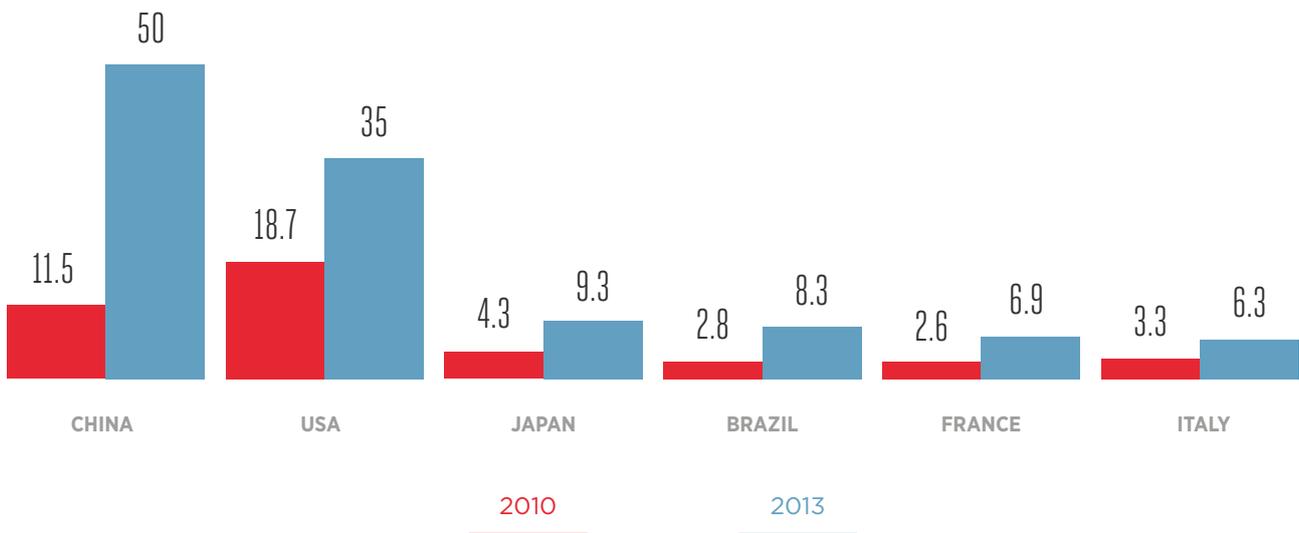
North America has seen significant growth in the number of machine-to-machine (M2M) connections⁷ over recent years. As discussed later in this report, automotive has been a particular historic focus for M2M deployments, but the range is widening with an increasing focus on the consumer segment.

The US is the world's second largest market for M2M connections, having been overtaken by China during 2013. However, North American accounted for almost a fifth of total global M2M connections at the end of 2013. In both the US and Canada, M2M connections accounted for just under 10% of total mobile connections in 2013.

Source: GSMA Intelligence

Largest M2M markets 2013

Connections (m)



7. The GSMA Intelligence M2M connections data used in this report refers exclusively to a SIM connection that enables mobile data transmission between machines. It does not count SIMs used in computing devices in consumer electronics such as smartphones, dongles, tablets, e-readers, routers and hotspots

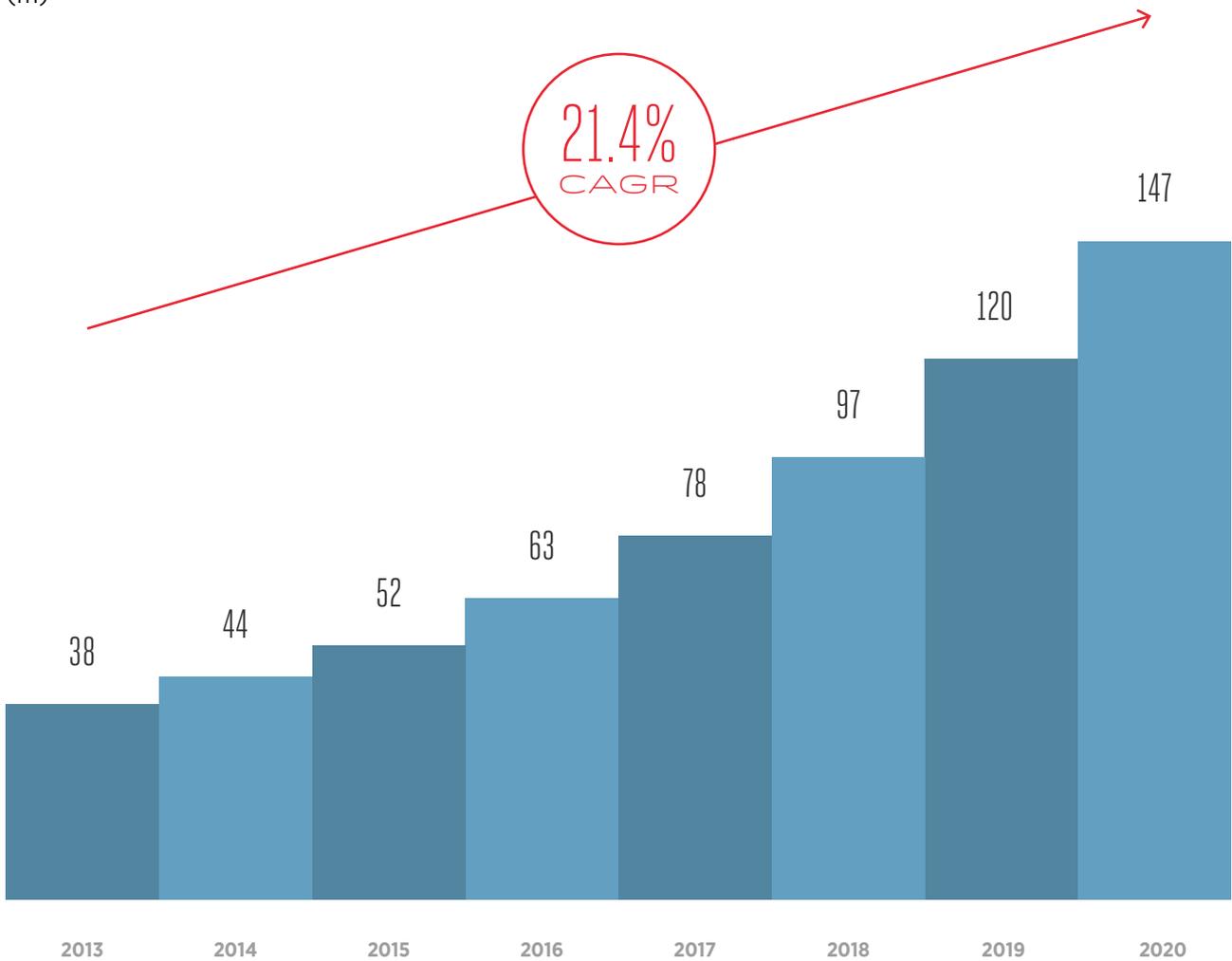
Going forward, the number of M2M connections in North America is expected to grow at CAGR of just over 21%, reaching a total of 147 million by 2020. These forecasts focus only on cellular-based M2M connections, and do not include growth in the wider universe of Internet of Things (IoT) devices that may connect using alternative technologies.

These cellular M2M forecasts reflect the current trajectory that the market is taking based on known and tangible deployments, opportunities and growth inhibitors for each operator and M2M sector. However, there are upside scenarios to these forecasts if a number of these growth inhibitors are addressed by industry players, regulators and governments over the coming years.

Source: GSMA Intelligence

M2M connections North America

(m)



1.5 Revenue growth set to slow

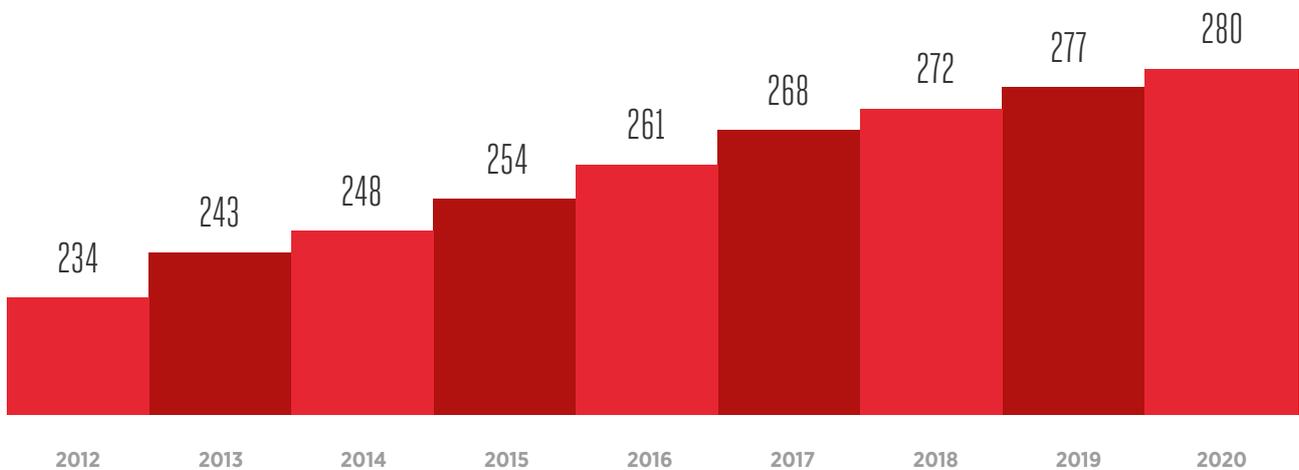
The North America region has seen healthy revenue growth over recent years, driven by a range of factors including increasing mobile broadband and smartphone adoption. Crucial to this has been the ability to monetise data traffic growth, with operators in the US enjoying a largely virtuous cycle whereby tiered data plans allow data consumption to be shared across a number of devices or family members. This in turn encourages the connection of a range of data intensive devices, further driving both data volumes and revenues for operators.

These trends have allowed operators in the region to deliver healthy revenue growth over recent years—at a time when operators in developed regions have seen revenue trends deteriorating. Over the period 2008-2013, revenues in North America grew a compound annual growth rate (CAGR) of 4.7% per annum, slightly above the global average figure of 4.5%. This was well ahead of the outcome in Europe, where revenues declined at a CAGR of 3% per annum.

Source: GSMA Intelligence

North America operator revenues

(US\$ B)



Going forward, revenue growth in the region is expected to slow, in line with trends in the mobile industry across the globe. This reflects a number of factors, including increasing competition, market saturation and the impact of new services that potentially cannibalise existing revenue streams. Forecasts indicate that revenues in the region will grow at just over 2% per annum out to 2020, slightly below the global average figure but still ahead of the outlook for Europe (where revenues are still expected to decline). However, operators are also looking to diversify their revenue streams and launch new services and applications, which may begin to make a more meaningful contribution to revenues going forward.

1.5.1 Impact of online messaging services in North America

North America is home to a number of fast growing online messaging service (OMS) providers, including Facebook Messenger, WhatsApp and Snapchat. Whilst all these services have seen high adoption levels in the US market, WhatsApp, in particular, is seeing the strongest subscriber growth in international markets, especially in the developing world. Although there has been considerable focus on recent moves by WhatsApp to add voice services, a number of voice focused OMS services already exist. For example, Skype and Google Voice (the latter only available in the US market) have been available for some time, but have had limited impact and uptake by mobile subscribers in North America.

What is particularly noteworthy is that these online messaging services have had limited impact on ARPU and revenues for operators in North America, despite high levels of both smartphone and mobile broadband adoption. This reflects the success of operators in the region in monetising data traffic growth, as well as the low effective retail prices for voice and messaging in the most common tariff bundles. In contrast, operators in Europe and many developed markets are still more dependent on revenues from traditional voice and messaging services. Operators in these markets are responding by offering more generous bundled tariffs (including unlimited voice and messaging as well as often capped data allowance), significantly reducing the effective retail price per minute or message.

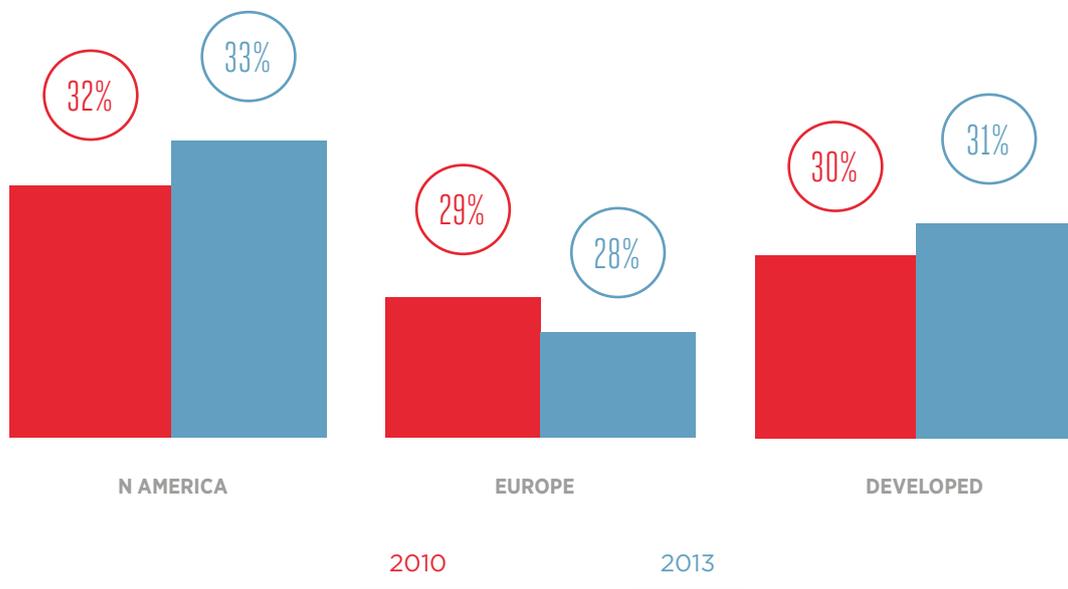
This is not to say that the North American operators are immune to these broader trends in the competitive landscape in the mobile industry. Data from the CTIA indicates that total SMS volumes in 2013 were down almost 20% from their 2011 peak, although voice minutes are continuing to grow. However, the growing popularity of these messaging services is likely to have more of an impact going forward, and are one factor contributing to the expected slowdown in revenue growth over the coming years.

1.5.2 Profitability in North America above other developed markets

EBITDA margins are generally higher in North America than in other developed markets. For the US operators there is a broad range of margins: Verizon Wireless in 2013 reported a margin over 40%, whilst Sprint's figure was in the mid-teens. In contrast, all three operators in Canada reported margins in the mid-40% range in 2013.

Source: GSMA Intelligence

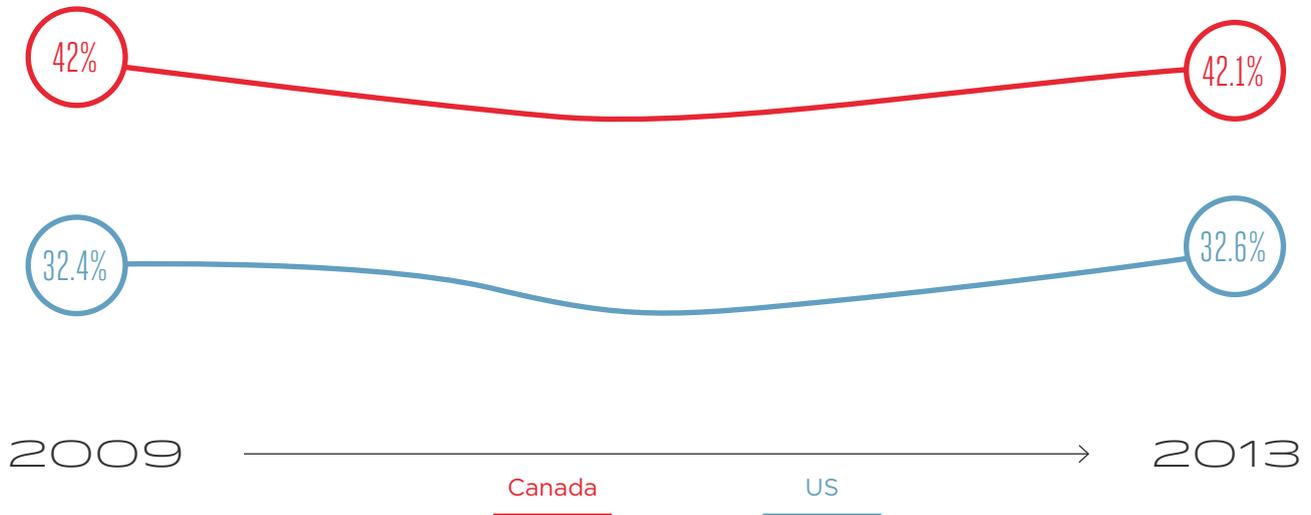
Mobile operator EBITDA margins by region



Margins have been impacted in recent years by the strong uptake of smartphones. Additionally, margins for operators in both Canada and US have fallen due to strong growth in connections and the high proportion of smartphone sales, with operators spending an increasing amount on handset subsidies.

Source: GSMA Intelligence

EBITDA margin trends



However, there are clear signs that margins are beginning to improve across the region. This is helped by operators looking to rationalise handset subsidies and to move towards new financing and device upgrade packages, especially in the US market. This trend was started by T-Mobile and is now being copied by the other three main US operators. These plans explicitly separate the monthly payment for services from the payment for the handset device, giving consumers the option of using their existing device or paying for a new one through an instalment plan. Sprint in particular reported a strong improvement in its EBITDA margin in the first quarter of 2014. The company's wireless EBITDA was up nearly a third over the same quarter of the previous year and the margin up nearly seven percentage points.

There are similar trends in the Canadian market, as margins for all three main operators in the market are recovering. However, in all cases there have been no reduction in the 'cost of acquisition' per connection reported by the operators. Rather, a slowdown in new connection growth rates (as the smartphone market appears increasingly saturated) seem to have been the key driver.

To date, the Canadian operators have not followed the US example in unbundling handset payments from the mobile service cost. However, operators have introduced new upgrade plans, with for example Rogers launching its 'Next' plan and Telus 'T-Up'. Under these plans, subscribers can pay a monthly fee which allows them to upgrade their handsets on a more frequent basis.

There are similar upgrade plans in the US market, such as T-Mobile's 'Jump' and AT&T's 'Next'. AT&T's Next programme has gained strong traction with customers. The company reported in the second quarter of 2014 that 50% (3.1 million) of gross smartphone additions were through Next. The programme, which involves customers paying for a device in monthly instalments, has proved more successful once it was amended to include a discount on service plan fees.

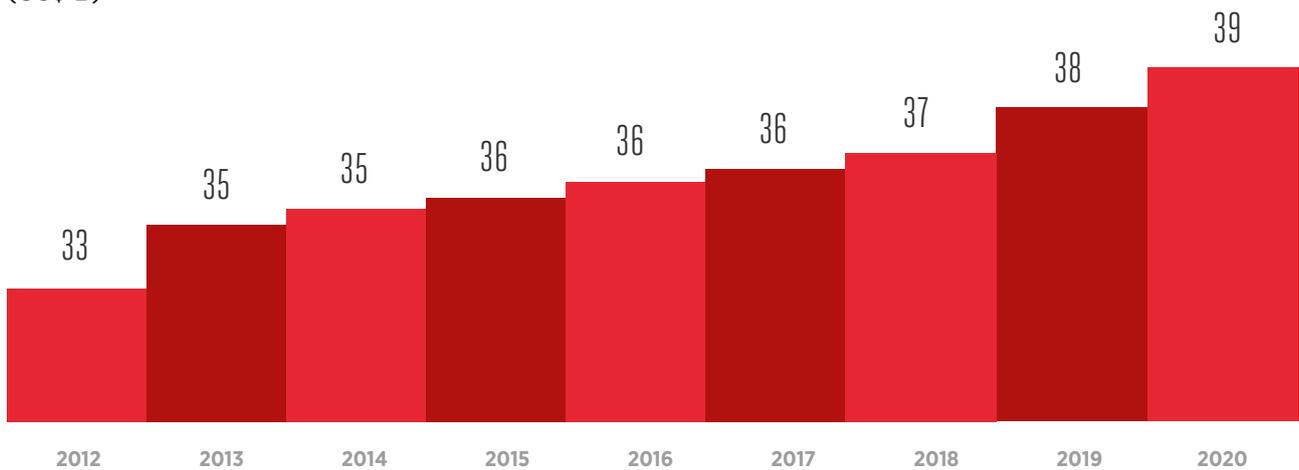
1.5.3 Substantial operator investment to fund network build outs

Positive revenues trends and relatively healthy margins have helped operators fund significant network investments over recent years. Operators in North America have invested US\$175 billion over the last six years, equivalent to around 14% of revenues. Capex levels over the period grew at a CAGR rate of 8% over the period, the fastest growth rate of

any region and with 4G network deployments a key driver of the strong uptick in investment levels. Going forward, capex is expected to grow at a slower rate, though with forecasts suggesting the potential for a further pick up in capex levels towards the end of the period.

Source: GSMA Intelligence

North American operator capex
(US\$ B)



The mobile operators in Canada have provided extensive and high quality network coverage despite the particular challenges of low population densities in the country. In 2013, Canada had just 15 wireless connections per square kilometre of wireless network coverage – less than one tenth the EU average of 155, and well below the US figure of 51 connections per square km of wireless network coverage⁸.

8. <http://www.navigant.com/-/media/WWW/Site/Insights/Economics/Navigant-Mobile-Wireless-Canada-FINAL.ashx>

1.6 A more supportive regulatory regime in the region

The mobile industry in North America has generally benefitted from a more supportive regulatory backdrop than many other developed regions, particularly when compared to Europe. This has certainly played an important role in the strong performance of the industry in the region over recent years.

For example, regulators in the US have typically taken a more laissez faire approach to merger control and consolidation, certainly as compared to the situation in Europe⁹. There have been a number of consolidation deals in the US over the last 10 to 15 years, which have resulted in a more concentrated market structure. Between 2003 and 2012, the FCC approved 20 significant mergers and other mobile licence transactions, with a total value of US\$288 billion. It is noteworthy that the FCC justified its decision to approve the 2013 merger of T-Mobile and MetroPCS in part on its finding that the merger will “enable the deployment of a substantial LTE network nationally”.

The rapid deployment of LTE networks in the US benefited from the early release of Digital Dividend spectrum in 2008, as already highlighted. More generally, spectrum liberalisation has created relatively efficient allocation schemes in the US. This includes a robust secondary market in which license holders are able to engage in routine leasing and transference of mobile wireless licenses with minimal oversight and delay, as well as provide the services and deploy the technologies of their choice.

Canada has been slower to release Digital Dividend spectrum than the US, with Industry Canada making repeated decisions to delay the auction of 700 MHz spectrum. The auction was finally completed in January 2014, nearly six years after the US. Eight operators paid a total of C\$5.3 billion for spectrum.

Canada has more closely followed the US rather than Europe in allowing both spectrum use flexibility and a secondary market to develop. However, there have been criticisms that in practice the approach of the Canadian authorities has ‘been inconsistent and at times counterproductive in facilitating secondary markets and in minimizing uncertainty in the license renewal process’¹⁰.

9. http://www.gsma-mobile-wireless-performance.com/GSMA_Mobile_Wireless_Performance_May2013.pdf

10. <http://www.navigant.com/-/media/WWW/Site/Insights/Economics/Navigant-Mobile-Wireless-Canada-FINAL.ashx>

1.6.1 Consolidation and competitive trends in North America

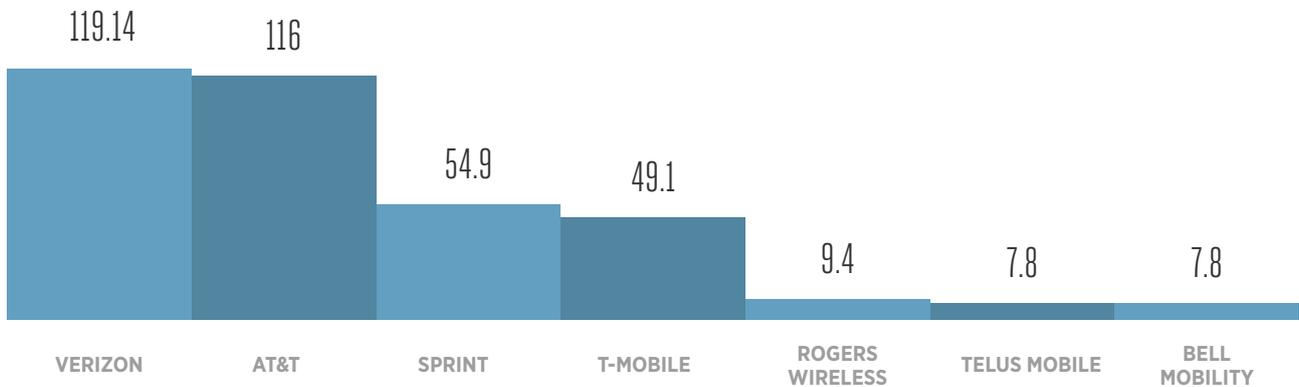
As highlighted previously, the US mobile market has seen significant consolidation over recent years. The market has evolved from one that was highly fragmented to one that has consolidated to four major national network operators. The last major consolidation deal in the US included the merger of Sprint and Nextel in 2004, whilst the US authorities blocked the proposed acquisition of T-Mobile by AT&T in 2011.

More recently there has been an increasing trend for some of the remaining smaller regional carriers to be acquired by the larger operators. AT&T acquired Leap Wireless in early 2014, while MetroPCS merged with T-Mobile in 2012. As a result of these developments, the US market is dominated by two larger operator, Verizon and AT&T, with two smaller network operators Sprint and T-Mobile. In addition, there are a number of smaller regional operators in the US. In contrast, the main three operators in the Canadian market are broadly similar in terms of the number of connections.

Source: GSMA Intelligence

Connections by operator (including M2M)

(Q1 2014, m)



Over the last few years, the largest two US operators have seen their market shares increase, with T-Mobile and Sprint reporting a flat or declining number of connections (especially in the contract market). There are indications that competition has increased in the US over recent quarters, with T-Mobile, in particular, looking to refresh its brand and regain momentum with a range of new offers and tariffs. The company launched its 'Uncarrier'

strategy in early 2013 in an effort to address its declining contract subscriber base. This has included the carrier's offer to pay off a subscriber's early termination fee when breaking a contract with one of the other operators (ETFs); aggressively priced new tariff plans; as well as a range of 'no-contract' plans. T-Mobile has also abolished international text and data roaming charges for subscribers travelling to over 100 different countries.

As highlighted earlier, the company also introduced a phone upgrade plan – branded ‘JUMP!’ which allows consumers to upgrade their phones twice a year. As a result, T-Mobile noted in early January 2014 that it registered close to one million net additions in ‘branded’ customers in Quarter 4 2013, and close to half a million MVNO net additions.

This more aggressive strategy may have a broader impact on pricing in the US mobile market and force the larger two operators to lower prices more significantly than they have to date. For now the likelihood of any such move appears to be limited, with for example the Verizon Chief Financial Office stating post the company’s first quarter results that it would “not overreact to a competitor”. However, this position may change, especially if T-Mobile continues to gain market share.

1.6.2 Prospects for further consolidation in the US market receding

Extensive press reports in the first half of 2014 highlighted the potential for further consolidation in the US mobile market, with Sprint (now owned by the Japanese operator Softbank) making clear its interest in acquiring T-Mobile. Sprint Corporation President Masayoshi Son stated that he would start a “massive price war” in the US if regulators allow the deal. However, it appears that Sprint has now abandoned this plan, largely due to clear signs of opposition from regulators.

US regulatory authorities previously blocked the proposed acquisition of T-Mobile by AT&T Wireless in 2011, and it appears in general that they are sticking to the principle clearly stated at the time of not allowing the US market to consolidate down to three national operators. The FCC’s Chairman Tom Wheeler responded to news that Sprint had abandoned its bid for T-Mobile by stating that “four national wireless providers is good for American consumers”¹¹.

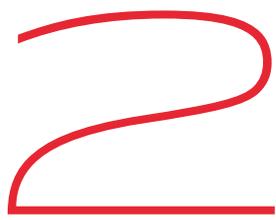
Following the end of negotiations with T-Mobile, Sprint appointed entrepreneur Marcelo Clause as Chief Executive Officer and it appears committed to pursuing a more independent strategy. Sprint Chairman Son was quoted as saying “while we continue to believe industry consolidation will enhance competitiveness and benefit customers, our focus moving forward will be on making Sprint the most successful carrier.”

Following Sprint’s withdrawal from the bidding process for T-Mobile, the French mobile operator Iliad has submitted a bid for T-Mobile. Iliad’s initial offer of US\$15 billion for a 56.6% stake in the company was rejected by T-Mobile’s parent Deutsche Telekom. It remains to be seen whether Iliad will be successful in its approach, but as such a deal will not involve a reduction in the number of operators in the US market it is likely to face fewer regulatory obstacles.

11. <http://www.fcc.gov/document/chairman-wheeler-statement-competition-mobile-marketplace>



The direct contribution of the mobile ecosystem to GDP in North America is larger than the air, rail and water transportation sectors combined.



Mobile makes a significant contribution to economic growth in the region

The mobile sector makes a very significant contribution to the North American economy. In 2013, the mobile sector contributed 3% to GDP across the region. This overall impact includes a direct contribution from the mobile ecosystem of US\$218 billion (1.2% of GDP), an indirect contribution from induced activity in the rest of the economy of US\$43 billion (0.2% of GDP), and a further contribution from increased productivity brought about by the widespread use of mobile technology by businesses and workers of US\$289 billion (1.6% of GDP). The direct economic impact of the mobile ecosystem¹² is measured by the value added to the economy, which is equivalent to the payment of wages, tax contributions and business profits by the industry¹³.

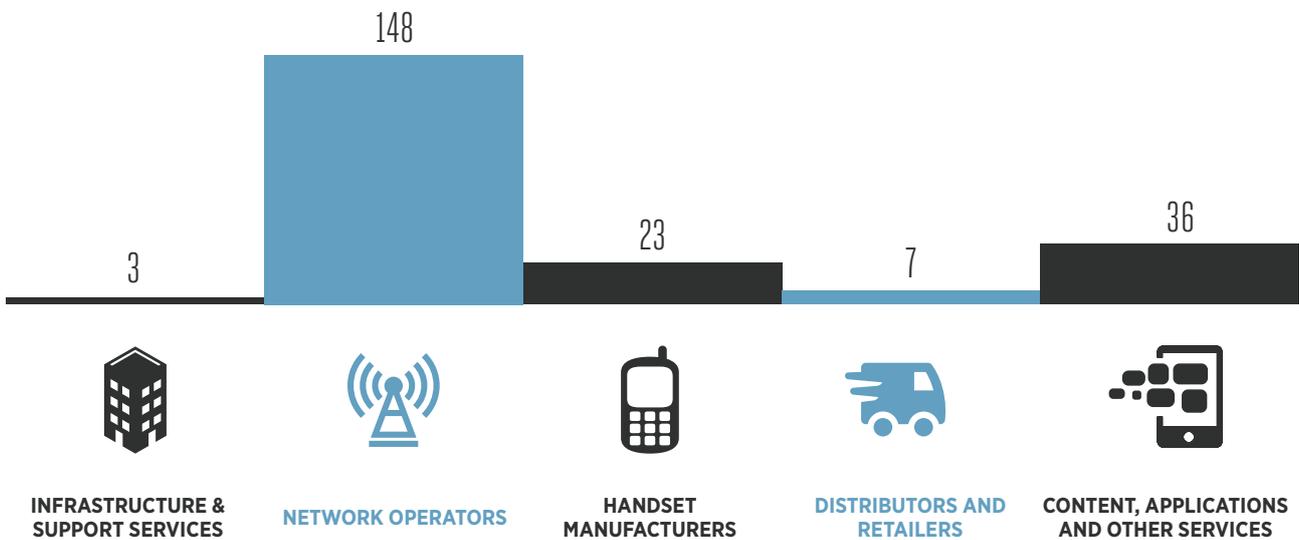
12. The mobile ecosystem includes the mobile network operators as well as the direct participants in the mobile industry's supply chain, including infrastructure and support services; handset manufacturers; distributors and retailers, as well as content and application service providers

13. Value added by the sector can also be approximated as the difference between the value of sales made by the sector and the direct cost of making these sales.

Source: GSMA Intelligence

2013 direct GDP contribution of mobile ecosystem

(US\$ B)



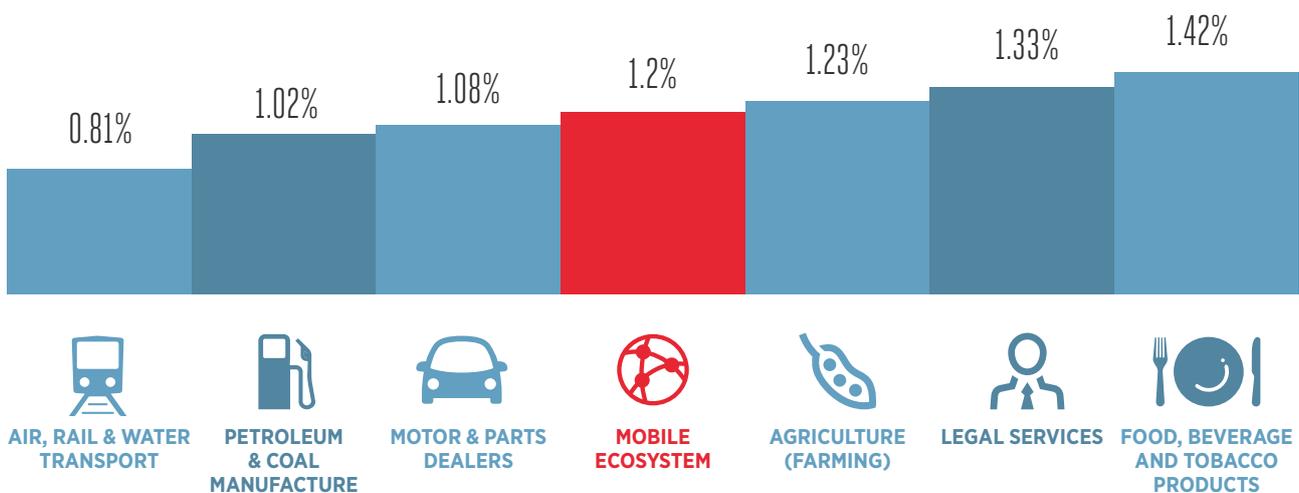
In order to better understand the magnitude of this impact, it is useful to compare the direct contribution of the mobile ecosystem with the economic activity generated by other industries in the region. In value added terms, the direct contribution of the mobile ecosystem to GDP in

North America was larger than the air, rail and water transportation sectors combined, and also the motor vehicle and parts dealers sectors. The economic activity generated by the mobile industry was also roughly comparable in size to other major sectors in the region like agricultural farming or legal services.

Source: GSMA Intelligence

Value added by industry group in North America

(2013)



The economic activity directly generated by the mobile ecosystem has a multiplier effect on the rest of the economy. This is because some of the income generated by the mobile ecosystem in the form of wages, taxes or profits is then spent across other parts of the economy. This means that other sectors also benefit indirectly from the value added by the mobile ecosystem. We estimate that this effect resulted in the generation of additional economic activity in North America of US\$43 billion in 2013.

Finally, in addition to the direct and indirect contribution to GDP by operators and the mobile ecosystem, an estimated extra 1.6% in GDP was

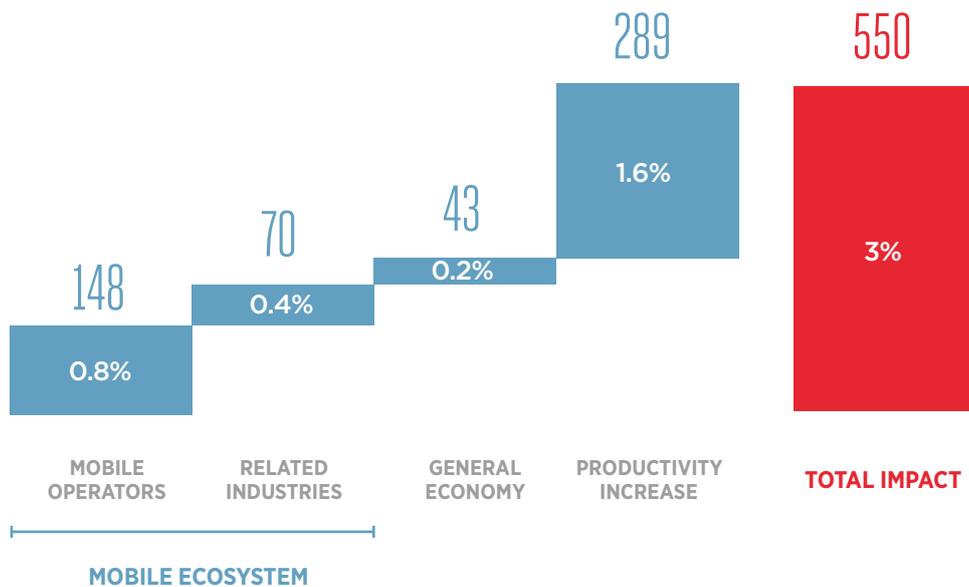
accrued from the increased productivity brought about by the widespread use of mobile technology across all sectors of the economy. Mobile technology facilitates productivity improvements for many workers and businesses, for example by reducing unproductive travel time, allowing more effective decision making, and facilitating improved logistics. This productivity impact is estimated to have made a further US\$289 billion contribution to GDP.

Overall, the mobile industry generated a total GDP impact of US\$550 billion or 3% of North America's GDP in 2013.

Source: GSMA Intelligence

GDP Impact North America

(US\$ B)

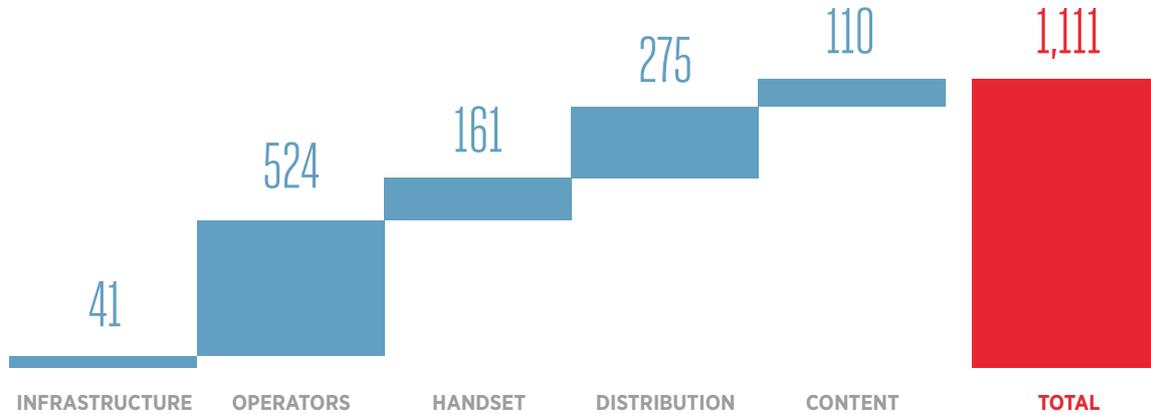


The mobile ecosystem directly supported about 1.1 million jobs across North America in 2013. The main portion of this contribution comes from network operators themselves, with more than 500,000 direct employees. A significant number of direct jobs were also supported in infrastructure and support services, content providers, distributors and handset manufacturers.

Source: GSMA Intelligence

Jobs directly supported in North America

(2013, thousands)



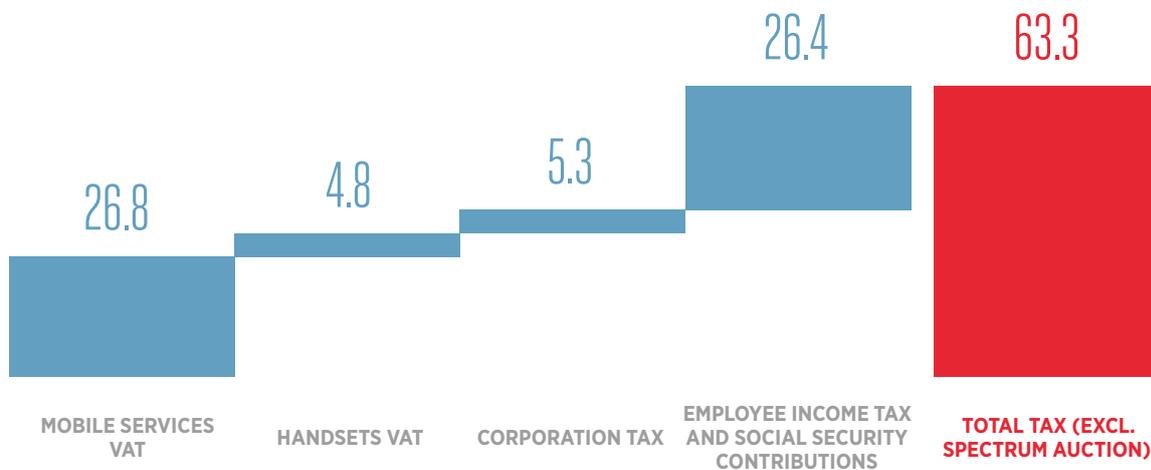
A significant proportion of the mobile industry's wages, public funding contributions and profits are re-spent on the economy, which means that jobs in other sectors were also indirectly supported. We estimate that 380,000 jobs were indirectly supported, bringing the total impact of the mobile industry on jobs to 1.5 million.

The mobile ecosystem also contributes greatly to public funding in North America, even without considering the revenues from spectrum auctions and other regulatory fees. Payments come from a range of direct and indirect taxes including VAT, corporation, social security and income. The overall contribution in 2013 was around US\$63 billion.

Source: GSMA Intelligence

Public funding contribution

(US\$ billion, 2013)



Mobile operators have also made further contributions to the public finances of North American governments in terms of auction fees and other regulatory charges. In the US, mobile operators paid approximately US\$19 billion for 4G licence fees in 2008. In Canada, the 700MHz auction earlier this year raised nearly US\$5 billion.

Going forward, the mobile industry will continue to increase its contribution to economic activity and job creation in North America. By 2020 it is estimated that the mobile ecosystem will:

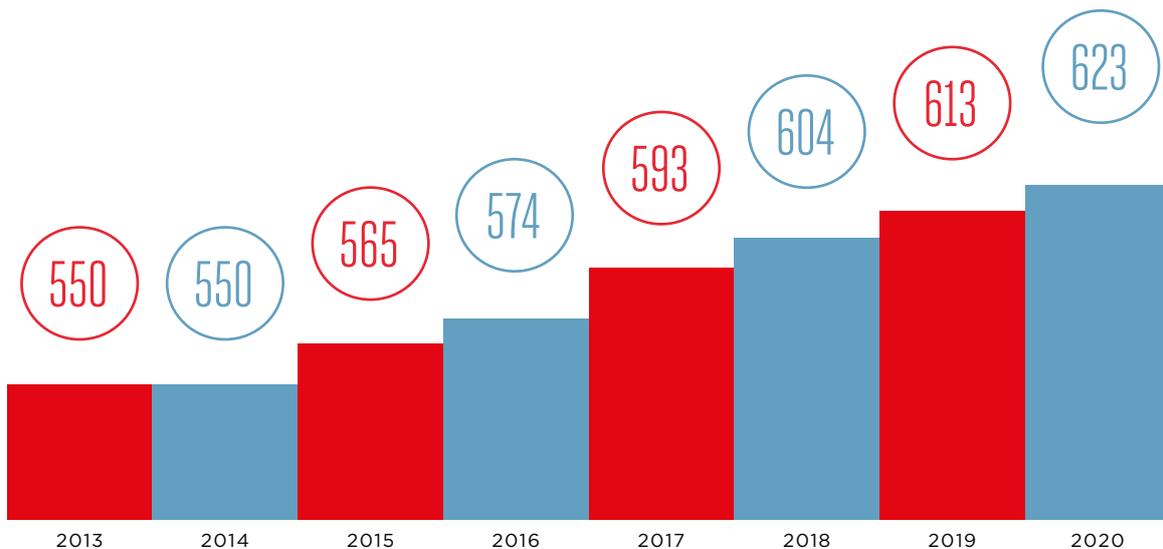


- Contribute US\$623 billion to North America's economy.
- Add US\$71 billion to public finances (excluding regulatory fees and spectrum auctions).
- Support more than 1.6 million jobs both directly and indirectly.

Source: GSMA Intelligence

The economic value generated by the mobile industry will continue to grow across the region in the period to 2020

(US\$ billion, 2013 real prices)



3 North America at the heart of the new mobile ecosystem

3.1 North America is playing a leading role in mobile innovation

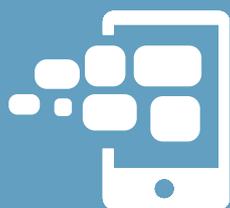
North America is at the centre of the new digital ecosystem, with the region playing a leading role in innovation and the development of new services and applications such as digital content, social networking and online commerce.

The region has also helped lead the development of a new and broader mobile ecosystem. The industry has evolved from its initial focus on basic services (voice and messaging) and simple devices (feature phones), to a new and vibrant ecosystem based on high speed mobile broadband networks and advanced smartphones, tablets and other connected devices.

These developments have had a profound impact on all aspects of life. The industry has moved beyond simple communications services and brought greater convenience to individuals and consumers through, for example, new social messaging applications and services such as mobile banking. Companies such as Apple, Facebook and Google are key drivers of innovation and new services in this broader ecosystem. They have had a significant impact on the mobile and internet industries not only in North America but also globally.

Apple, in particular, is noteworthy for the way it has transformed aspects of the mobile industry and helped shaped the new ecosystem. Apple launched the first iPhone in 2007, but of greater importance was the role of the iOS operating system and the development of a broader platform for new applications and services. Google reacted with the development of its Android operating system, which now is by some way the leading platform for smartphones across the world.

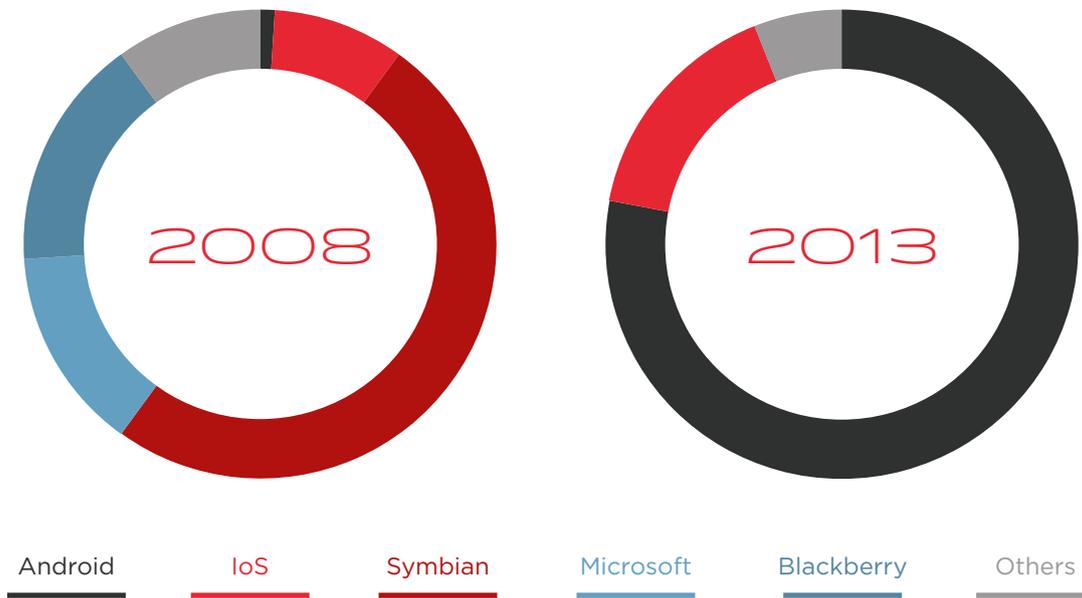
Over recent years, operating systems originating in North America have come to dominate the global smartphone market. Between 2008 and 2013, the proportion of global smartphone sales based on Android or iOS increased from 51% to 94%, clearly establishing the dominant role of the North America region, even as Blackberry's OS became less relevant.



The region plays a leading role in innovation and the development of new services and applications.

Source: Strategy Analytics

Smartphone sales by OS



Whilst most smartphones and tablets are manufactured outside of North America, handset sales have not been driven so much by the device's features, but rather the ease of use of the operating system and in particular the range of applications available. The success of both Android and iOS has been based on their ability to attract developers to produce an ever growing range of applications.

The success of the dominant mobile platforms creates a virtuous circle of innovation and investment, as the largest platforms attract more investment and developers. This in turn delivers more applications and a greater appeal to consumers. In turn, the rapid deployment of mobile broadband networks and high levels of smartphone adoption in North America has led to strong consumer and business demand for these new services.

Data from App Annie indicated that by mid-2014 there were over 1.5 million applications available on Google Play, with the number growing by around 60% over the preceding twelve months. The US remains the largest single market in the number of app downloads from Google Play. Data from

Appnition suggests that the app economy in the US alone was worth US\$72 billion in 2013, a figure that is forecast to more than double to US\$150 billion by 2017.

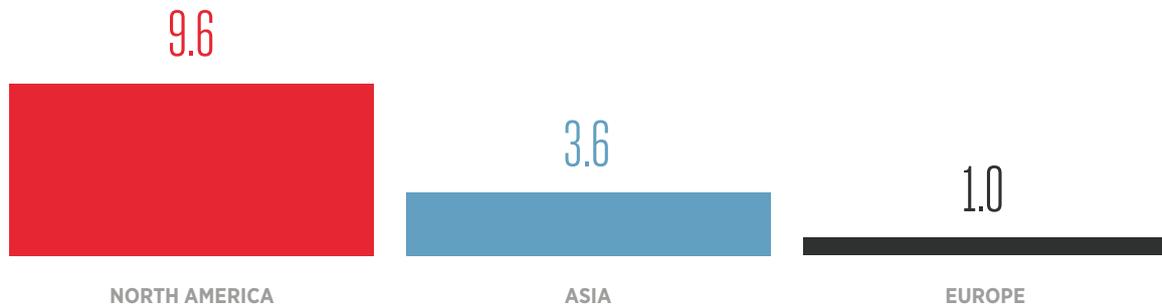
Beyond the direct economic contribution, the growth of the app economy in North America has had wider social benefits in areas such as health, education, commerce and transport. Mobile technology is not only changing how these industries do business, but also how consumers experience them. A number of these industries are explored in more detail later in the report.

We are now seeing a broader range of innovation as companies and start-ups emerge, and look to rapidly gain scale and users, often with new business models. These include new online messaging service providers such as Snapchat, Instagram and WhatsApp (the latter two both now owned by Facebook). The US in particular has seen innovation and start up hubs emerge across the country, which are attracting significant venture capital flows, allowing new services to develop and scale rapidly.

Source: CB Insights

VC and PE funding to mobile software and services

(12 months to June 2014, US\$ billion)



3.2 Digital commerce

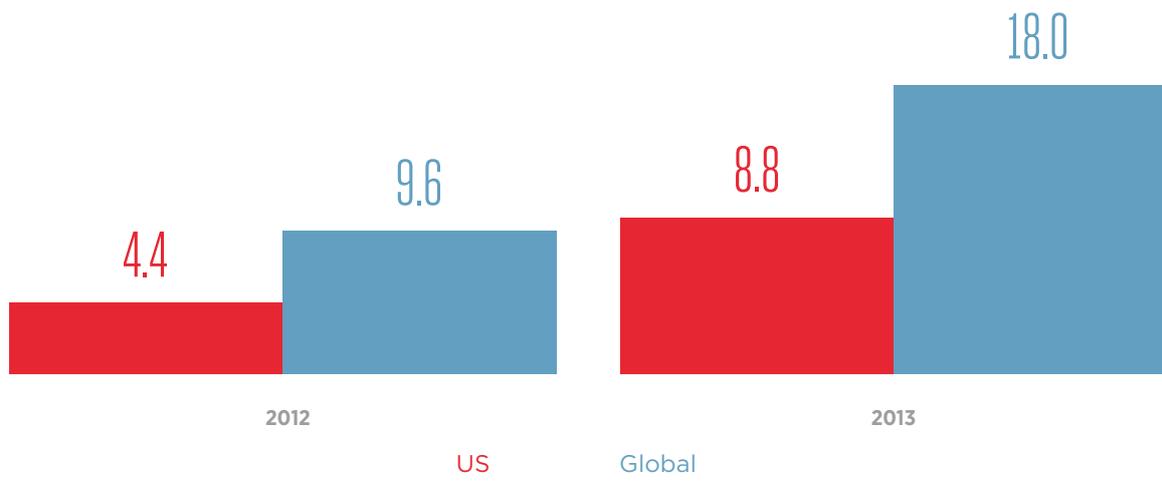
As the internet has gone mobile, search and advertising were two of the first commercial areas to develop on mobile networks. The US market has seen significant growth in mobile advertising spend

in recent years, reaching almost US\$10 billion at the end of 2013. This was well over twice the figure in 2012, and means that the US accounts for over half of the global total.

Source: eMarketer

Mobile internet ad spending

(US\$ billion)



Mobile commerce is seeing rapid growth in North America, with research from Forrester suggesting that consumer purchases on mobile phones would total US\$38 billion in 2013, with a further US\$76 billion spent on tablets. This gives an aggregate spending growth rate of over 60% compared to the prior year. The ongoing growth in mobile commerce reflects both the increasing adoption of smartphones and tablets, but also crucially the fact that consumers are becoming more comfortable using their mobile devices to make purchases.

North America has seen considerable innovation in the online and mobile commerce space. For example, Square was a mobile payments start-up that allowed users to take credit card payments on their mobile phones via a card reader and an app. Moreover, PayPal has played an important role in the broader development of digital commerce in North America, and is looking to replicate this in the areas of mobile commerce and payments. PayPal has a mobile app that offers a broad range of services, including allowing users to transfer funds to others and make online purchases. The app can also be used for in-store purchases and has seen wide acceptance from merchants, with the company

reporting that 1.9 million merchant locations across the US already accepted its payments at the start of 2014¹⁴.

A number of retailers are also active in the mobile payments space, with Starbucks offering a mobile app that allows consumers to assign their credit card number and then simply swipe the phone to pay. This has proved very successful, with the company indicating that towards the end of 2013 over 11% of its sales now used the mobile app, with over four million mobile payments per week¹⁵.

Several other retailers have followed the example of Starbucks in launching their own mobile payments apps. In addition, Google has developed their own mobile payments system, 'Google Wallet'. This was launched in 2011 and allows user to store details of their debit/credit cards as well as loyalty programmes. Users with NFC-enabled smartphones are able to tap their phone on NFC readers to pay in store, whilst others can send money to anyone in the US with an email address.

A growing number of mobile operators around the world have now launched their own mobile wallet services, and this is also the case in North America:



The ISIS digital wallet (which is now being rebranded to Softcard) is a joint venture between AT&T Mobility, T-Mobile and Verizon Wireless. The wallet supports three main services, including contactless payments (compatible with VISA, MasterCard, American Express and Discover payment networks), loyalty services and the delivery of offers/coupons for merchants¹⁶. The services in the wallet use data held in a secure element held on the consumer's NFC enabled SIM card, and access to the wallet requires a four digit pass code. The wallet was first launched as a trial in Salt Lake City and Austin in October 2013, and was offered on a nationwide basis at the end of 2013. The service operates on NFC-enabled Android handsets, whilst the operators have also begun to sell NFC cases for other smartphones. The most recent data from the operators indicated over 20,000 downloads a day of the mobile wallet over a 30 day period;¹⁷

Rogers Wireless in Canada has launched the Suretap mobile wallet. The wallet allows users with an NFC-enabled SIM and certain Android and Blackberry smartphones to make contactless payments using their CIBC credit cards.

14. <http://blog.ebay.com/nrf-2014-a-new-online-checkout-experience-payment-code-is-rolling-and-paypal-beacon-update/>
 15. <http://seekingalpha.com/article/1790952-starbucks-ceo-discusses-f4q-2013-results-earnings-call-transcript>
 16. <http://www.gsma.com/digitalcommerce/wp-content/uploads/2013/10/Mobile-Wallet-Case-Study-ISIS-digital-version1.pdf>
 17. http://news.paywithisis.com/2014/05/14/isis_momentum_update_5_2014/

Loyalty schemes are proving to be important drivers for the uptake of mobile wallet services, a trend that is well shown by the success of the Starbucks app. Users receive 'stars' for each payment which can then be used for free drinks or food. Similar success has been reported by some of the ISIS wallet commercial partners, with, for example, Jamba Juice expecting to give away one million free smoothies over the course of 2014.

North America has seen a strong uptake in NFC-enabled SIM shipments in recent quarters according to data from the SIM alliance—a likely reflection of the success of a number of service deployments. Whilst Japan and South Korea are still the world's largest NFC markets, North America overtook Europe in 2013 with 24 million NFC-enabled SIM shipments (a figure that represented nearly a third of total global shipments in the year, and up from only 0.1 million in 2012).

3.2.1 The role of the GSMA in developing digital commerce

Digital commerce faces different challenges in different markets, often reflecting the level of local development. To address these challenges, the GSMA's Digital Commerce initiative is focusing on different issues in developed as opposed to developing markets. Mobile wallets have the potential to simplify the use of digital commerce services, allowing a user to manage a range of payment cards, loyalty programmes, vouchers and tickets. For developed markets, a key issue to help accelerate the deployment of mobile wallet services is the simplification of often complex interfaces between operators and other service providers:



Business-to-business (B2B) wallet interfaces: operators can play an important role in mobile commerce by storing secure credentials (such as credit card details) on the SIM card. However, the provisioning of these secure credentials is currently a relatively slow and fragmented process. Addressing this problem requires an interoperable solution between operators and service providers, which will reduce integration costs and time to market. A number of leading global operators have already committed to support this goal.

3.3 The potential of the Internet of Things in North America

Mobile is already delivering connectivity to a broad range of devices, allowing the development of innovative new services and applications. This is bringing a new wave of connectivity beyond tablets and laptops to connected cars, buildings, televisions, game consoles, smart meters and traffic control. It has the prospect of connecting almost anything and anyone. The Internet of Things (IoT) is the ability of devices to communicate with each other independent of any human. Mobile networks enable a host of innovative products and services that benefit consumers and businesses across a growing number of sectors. This is what the GSMA refers to as the 'Connected Life'.

As highlighted in the previous section, North America is already home to a large number of M2M connections, and growth rates going forward should continue to be strong. Automotive and health are two areas of particular focus in the North American M2M market, which are explored further in the next section.

Several of the mobile operators in the region are playing an active role in the development of the M2M market, whilst ecosystem players such as

Google and Apple are also increasingly active. Google acquired the smart thermostat provider Nest Labs in early 2014, whilst Apple has announced its 'HomeKit' software platform which lets users control connected devices around the home through smartphones and tablets. Both companies are looking to transfer the success of their smartphone operating system platforms to the emerging opportunities around the IoT.

A recent report from GSMA Intelligence highlighted that across the world the M2M market is now moving from a period of 'hype' and market development to one with an increasing focus on real commercial deployments, with the North America region providing a clear example of these trends.¹⁸

The US market for M2M connections is noteworthy for the fact that most operators are no longer selling 2G connections, whilst in some areas (such as automotive) an increasing proportion of new connections are 4G. Several of the operators in the region have flagged the opportunities that 4G service could offer, with higher speed connections and big data capabilities, opening the door to new services and business models.



AT&T has established different business units to serve the M2M market, with one aimed at the consumer market. AT&T Digital Life is a security/home automation consumer offering. The service was launched in mid-2013 and now has been rolled out across the country, offering 24 hour home security based on the company's owned and operated monitoring centres. The service connects to AT&T's 3G network and can be managed through a range of devices including smartphones, tablets and PCs.

Verizon also offers a range of solutions for the home, including a Home Monitoring and Control system. This includes a smart thermostat that allows the remote managing of air-conditioning and heating systems, as well as the monitoring of the home security system.

18. http://www.gsma.com/connectedliving/wp-content/uploads/2014/02/M2M-report_GSMAi.pdf

3.3.1 Automotive

North America is one of the world's largest automotive markets, as well as being home to several of the world's largest manufacturers. There has also been support for the growth of the connected car market in the US from the insurance market, both as a means of launching new products (such as pay-as-you-drive) but also to help reduce insurance premiums.

Services based on M2M connectivity are offered in both the consumer and commercial markets, ranging from basic fleet telematics to more advanced security and infotainment services.

Operators in the US (and one or two other markets such as Australia) are deploying 4G-LTE technologies in the automotive sector, while others are currently working with 2G/3G technologies. In-vehicle technology is becoming an increasingly important differentiator in the marketplace, and there are a number of innovative services on offer in North America:



AT&T has partnered with General Motors to offer an upgrade on Star services in new car models from 2015. The service will include voice calls and in-car Wi-Fi hotspot; safety and security features; car diagnostics; and a range of infotainment applications including video streaming. The two companies have also agreed that AT&T customers will be able to add their new 4G connected vehicles into the data consumption on their existing shared mobile data plans. The service will also be available in Canada.

Verizon has launched the 'mbrace2' in-vehicle telematics system, a cloud-based system which allows Mercedes Benz owners to access the car's connected features via a smartphone as well as through dedicated buttons in the vehicle. This offers a range of security and location based services.

There have also been moves from other technology companies to enter the mobile automotive market. Google has formed the Open Automotive Alliance with several car manufacturers, with the aim to use the Android operating system for in-car infotainment services.

3.3.2 Mobile health

Mobile has the potential to transform the delivery of health services to populations across the world. The US health system faces particular challenges, being the most expensive in the world with total spending in 2012 at US\$2.8 trillion¹⁹. In addition, North America faces similar challenges to other developed regions, with an increasingly aging population and a growing incidence of chronic diseases putting further pressure on health budgets.

Mobile health has gained particular traction in North America, with the region at the forefront of mobile health deployments²⁰. Remote monitoring of patients, in particular, is an opportunity to significantly lower costs by reducing the amount of time patients spend in hospital and the rate of re-admissions.

Many mobile health services in North America are network agnostic and operate on either mobile, Wi-Fi or fixed networks. However, there are some market examples of pure cellular solutions:



Sprint recently launched the Samsung Galaxy S[®] 5 Sport, a new Spark-enabled smartphone aimed at health-conscious users. The handset's features include S Health™, an integrated mobile health platform that allows users to access a range of health information, plan workouts and monitor eating choices. The device also checks heart rate before and after activity with a built-in monitor.

SaskTel and Alcatel-Lucent launched a 'Lifestat Remote Monitoring and Health Management' service in 2008 that records and transmits daily blood glucose and blood pressure readings. The service automatically creates reports that can be accessed by the patient, carers and medical professionals.

Through its Lifecomm subsidiary, Verizon provides a mobile personal emergency response system (PERS) that offers a range of services to elderly customers, giving users the flexibility of remaining connected whilst away from home.

AT&T has a similar mobile PERS system that was developed in collaboration with Philips, allowing similar monitoring outside of the home as well as emergency voice capabilities. This is marketed as the Lifeline GoSafe. The product can also detect a fall and call for help, if the user does not press the GoSafe button.

19. <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/highlights.pdf>
 20. http://www.pwc.in/assets/pdfs/telecom/gsma-pwc_mhealth_report.pdf

3.3.3 Deployments in other areas gaining momentum

Cities worldwide face a number of common challenges, particularly around the issues of population growth, climate change and the need to move to a more sustainable growth model. Smart city initiatives are being established in areas across the world in an effort to address these challenges. Whilst deployments in North America to date are less common than in other developed regions such as Europe and parts of Asia Pacific, there are a number of examples in both Canada and North America:



There have been a number of initiatives in Dubuque, Ohio. The installation of smart water meters led to a saving in household water consumption, whilst there have also been schemes to provide real time transport information based on data gathered from mobile phones, in-vehicle GPS data and fare collection systems²¹.

A public-private partnership in Envision Charlotte, North Carolina is helping the city achieve its goal of economic growth through environmental sustainability²². The programme aims to reduce the consumption of limited natural resources in four key areas (energy, water, air and waste) by up to 20% in a five year period. The first phases of the project included 'Smart Energy Now', with smart meters installed in 65 commercial office buildings to track their energy usage, with data transmitted on the Verizon LTE network. The project provided a clear example of collaboration between a number of players, including the city authorities, the mobile operator, and the local utility company Duke Energy.

There have been a number of smart parking trials in the region, including in San Francisco and Los Angeles. In San Francisco the trial involves over 12,000 parking bays, with sensors and real-time data analysis used both to provide information on available parking but also to change prices to reflect local congestion and demand levels.

The development of smart city initiatives in North America may gain extra momentum with the recent announcement that AT&T and IBM will collaborate on the development of solutions for the IoT, but with an initial focus on 'creating new solutions initially targeted for city governments and midsize utilities'²³.

21. <http://www.ibm.com/smarterplanet/us/en/leadership/dubuque/assets/pdf/Dubuque.pdf>

22. <http://www.gsma.com/connectedliving/usa-envision-charlotte-north-carolina/>

23. <http://networkingexchangeblog.att.com/enterprise-business/att-ibm-join-forces-develop-internet-things-solutions/>

3.3.4 The role of the GSMA in realising the potential of the IoT

The initial focus of the Connected Living programme is to address key barriers and challenges that are prohibiting the development and growth of M2M/IoT connections and services across the world. This will be achieved by industry collaboration and appropriate regulation, as well as by developing key enablers to support the growth of the M2M market and new services and applications.



The GSMA works with its ecosystem partners to establish guidelines for how machines should communicate via the mobile network in the most intelligent and efficient way. The goal is to define future network requirements and capabilities that are required to allow operators to support IoT devices and services.

The GSMA's vision is to unite all industry stakeholders behind a single, common embedded SIM specification to help accelerate the growth in M2M connections. The GSMA recently announced an agreed specification for a machine (embedded) SIM²⁴ that addresses remote provisioning requirements. The embedded SIM specification project has the support of a number of the world's leading mobile operators, including AT&T.

The GSMA is working on a range of business enablers that aim to create a sustainable regulatory and policy environment that enables operators to deliver the consumer and business benefits of the IoT.

The GSMA is also working to identify and develop enablers that will support future network capabilities such as in the areas of end-to-end security, non-GSM device authentication and billing and charging.

The GSMA also engages with partners across the broader ecosystem to help drive adoption and facilitate the development of new services in markets including automotive, health, utilities and transportation. In the automotive field, the GSMA automotive special interest group allows automakers and operators to share information and enable industry cooperation, with the goal of resolving

barriers to connected car deployments and to speed the adoption of telematics and infotainment services. Several operators in the region participate in the forum, including AT&T, Verizon Wireless, Bell Canada, Rogers Wireless and Sprint. There are also active special interest groups for health & education, utilities and transportation.

24. <http://www.gsma.com/newsroom/gsma-publishes-embedded-sim-m2m-services/>

3.4 The mobile identity opportunity in North America

The rapid growth of online commerce, social media, gaming and other online activities in North America means that services are becoming more digital and mobile. This brings with it the growing need for individuals to be able to manage and authenticate their identities when accessing these online services. Consumers need convenient, secure and privacy protected digital identities to make it both safer and easier to access online services.

However, in an often fragmented content and application market, consumers can be frustrated by complex authentication processes. Mobile operators are well placed to act as the link for their customers between mobile and online services. Growing exposure to identity-based fraud and theft are beginning to bring to light the inherent weaknesses in traditional methods for online login and access. There are a number of examples of mobile identity deployments in several regions globally, although to date there have been no commercial launches in North America.

The US government's 'National Strategy for Trusted Identities in Cyberspace' is an initiative to improve the convenience and security of online transactions, and to allow individuals to manage and authenticate their digital identities.

3.4.1 The GSMA's role in developing mobile identity solutions

Reputation and trust are emerging as key themes for both consumers and service providers in the online world. As a result, they are increasingly turning to organisations with sufficient customer loyalty, trust and the operational capacity to deliver secure access services. In some cases service providers default to the large, global names in the online world, such as Facebook, Google and others. While these companies offer quick access to a global audience, the registration process behind each identity carried by these and other companies is cursory, and unable to provide the same level of assurance and relevance as a mobile identity service.

The use of mobile identity services offers benefits to consumers, mobile operators and other ecosystem players. It establishes the SIM card and the mobile medium as a frontline identity management service provider. Mobile operators are well placed in many markets to provide identity services, given their strong customer relationships which in some cases have been enhanced by the provision of other trusted services such as mobile banking.

The GSMA's Personal Data programme is working with the majority of operators that have launched mobile identity services across the globe to help realise their potential. The mobile industry needs to deliver common and consistent interfaces to a range of service providers, which at the same time need to offer seamless and convenient solutions to consumers.

The use of standards and interoperability are therefore key, in particular the need to create a common, industry-wide set of identity-related 'APIs' (application programming interfaces). The GSMA is also working closely with operators to establish a uniform set of APIs to underpin key mobile identity services. To help realise this goal, the GSMA has launched its 'Mobile Connect' initiative which aims to deliver broad interoperability across a range of operators and service providers²⁵. The initiative is supported by a number of leading operators from across the globe, as well as players from the wider ecosystem.

25. <http://www.gsma.com/newsroom/leading-mobile-operators-unveil-mobile-connect-initiative/>



For the full report on Mobile Economy:
North America 2014 please visit the GSMA website at
www.northamerica.gsmamobileeconomy.com

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