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**HIGH LEVEL DESCRIPTION OF IoT/M2M MARKET
TRENDS IN THE AMERICAS**

(Item on the Agenda: 4.3.5)

**(Information document submitted by GSM Association Latin
America)**



Cusco, 25th May 2015

Dear Sirs,

The GSMA welcomes the opportunity to contribute to the debate on the Internet of Things (IoT).

Through the Connected Living programme the GSMA helps operators to add value and accelerate the delivery of new connected devices to mobilise the IoT. This is to be achieved by industry collaboration, optimising networks and developing key enablers to support the growth of the IoT.

The positive impact of the IoT on citizens, consumers, businesses and governments promises to be significant, ranging from helping governments reduce healthcare costs and improving quality of life, to reducing carbon footprints, increasing access to education in remote underserved communities and improving transportation safety.

Many governments and regulators are recognising this tremendous impact and the value that mobile operators and other IoT suppliers can deliver. Governments can realise significant social and economic benefits through the growth of IoT services by ensuring supportive policies, and regulation is relevant, flexible, and technology neutral.

This document provides an initial contribution to the debate in the Americas. The GSMA produces a wealth of information on IoT, their ecosystem, the size and development of the markets as well as economics and technical reports on key aspects that policymakers and regulators should be aware of to maximise the benefits of this opportunity.

In this document you will find a high level description of IoT/M2M market trends for six key markets in the Americas. We also provide links to other reports that we believe inform the debate.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Sebastián M. Cabello", is positioned below the "Yours sincerely," text.

Sebastián M. Cabello

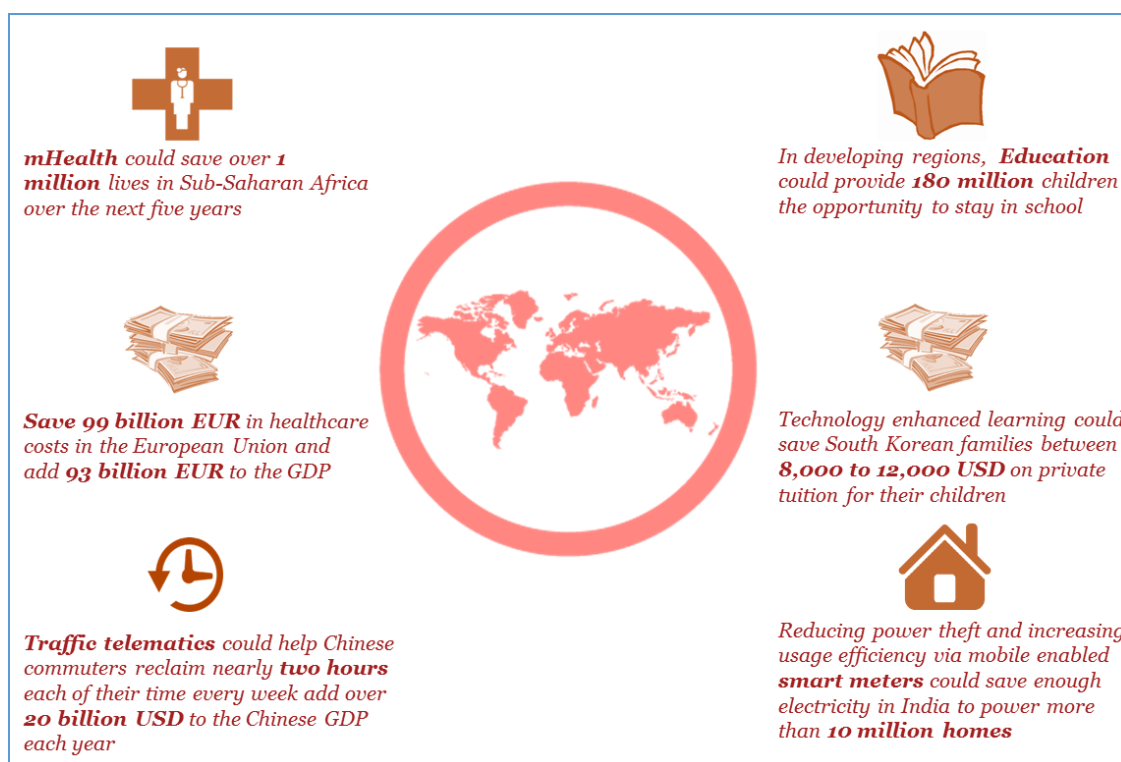
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Maximizing the benefits of IoT

The IoT formally refers to the use of intelligently connected devices and systems to leverage and analyse data gathered by embedded sensors and actuators in machines and other physical objects to help take decisions. Machine-to-machine (M2M) is often mentioned in conjunction with the IoT and is in fact a subset of it, referring to innovations in micro computing and wireless technology that allow embedded devices to collect and distribute real-time data without the intervention of humans, and already connects millions of machines today.

The IoT is transforming everyday physical objects that surround us into a connected system of assets which generate information designed to enrich our lives. From electricity meters to parking spaces to homes, the IoT is bringing more and more things into the digital fold. The wide range of socio-economic impact that the IoT could create draws upon recent analysis¹ conducted by PwC for GSMA² with respect to the potential of IoT for the year 2017.



IoT-enabled services enable access, increase efficiency and drive greater personalisation.

The key benefits generated indicated through IoT use cases can be broadly classified into three categories:

- **Enabling access:** Mobile-enabled IoT can ensure the delivery of services in remote and previously unconnected geographies;
- **Increasing efficiency:** Through the IoT, business can benefit from insights, visibility and control by real-time tracking of machinery, equipment and employees. This can cut wastage, increase productivity and safety and extend asset life;

¹ <http://www.gsma.com/connectedliving/news/new-pwc-report-mobile-networks-will-be-fundamental-to-enabling-the-iot/>

² http://www.gsma.com/connectedliving/wp-content/uploads/2015/04/Realising-the-benefits-of-mobile-IoTsolutions-v4_7Apr2015.pdf

- **Personalisation:** Through customer analytics, businesses will be able to understand and profile their customers better in order to be able to deliver more customised services at an individual level, thereby transforming the customer experience.

The IoT offers significant value to both emerging markets and advanced countries.

Emphasising the value of mobile data connectivity alone, a World Bank study estimates that a 10% increase in 3G or broadband subscribers has an incremental impact of nearly 1% point on GDP. The positive impact of the IoT, however, will be even more widespread and significant. According to Machina Research, the global impact of the IoT through cost reduction as well as new expenditure can be as much as 4.5 trillion USD in 2020. Analysts have estimated that business efficiencies achieved through the IoT will be valued at approximately 2 trillion USD by 2020, 1 trillion USD from cost reduction and 1 trillion USD from service improvement. This impact will be the result of major social and environmental benefits, such as improved healthcare, safer and efficient transportation and logistics, better education and efficient use of energy. Such benefits will be observed across both advanced as well as developing economies.

In advanced economies, the IoT will predominantly improve efficiency and enable personalisation. For example, the healthcare sector in these regions has to deal with the rising cost of care due to an ageing population and an elevated prevalence of chronic diseases. For patients suffering from chronic diseases, frequent hospital stays and clinic visits will be reduced through a revolution in remote monitoring enabled by sensors collecting medical data, connected devices transmitting the data to the healthcare provider, and analytics which track the patient's progress remotely. Thus, mHealth solutions will enable these countries save billions on healthcare costs, not just for chronic disease management but across the board, through remote diagnosis and monitoring, thereby enhancing the effectiveness as well as the efficiency of care.

The IoT will also create public value to both advanced as well as developing economies through efficient use of scarce public resources, smarter cities, lower urban congestion, safer roads, improved provision for healthcare, and targeted and personalised learning. Establishing the ecosystem to support IoT services will in itself create significant new business opportunities for mobile operators, equipment vendors, IT solution providers as well as other players in adjacent industries.

In developing economies, services such as basic healthcare, citizen's information, money transfer or education are not widely available due to a lack of physical facilities, poor logistics infrastructure and lack of affordability. IoT-enabled services will enable underserved communities to access and afford services, not attainable today, 'leapfrogging' them to overcome current infrastructure shortages which prevent them from using such services. In this way, IoT-enablement optimises the use of scarce resources by connecting them more intelligently and remotely. This will enable governments to prioritise investment on essential areas, and reduce the need to focus solely on building new hospitals and clinics.

In developing countries the IoT will also act as a vehicle for employment generation and inclusive growth, by creating new services at the local level which will require skilled as well as semi-skilled workers to deliver them. Leapfrogging will take place across several sectors since it creates extensions and enhancements to existing assets through technology, which in turn enables such assets to be productive for customers who are far away, or who cannot afford them in the form they are offered today.

Policy positions in the IoT

The GSMA has identified, together with its members a series of positions which should be considered as useful principles to inform the regulatory and policy debate in the IoT space. We provide below a selection of the most relevant.

Relevant, flexible and technology neutral policies

Governments will realise significant social and economic benefits through the growth of IoT services by ensuring policies and regulations are relevant, flexible and technology neutral.

Governments should ensure that a pro-investment environment is established and maintained across the IoT value chain. In order to reach global scale across consistent and reliable platforms, service providers and IoT device manufacturers need a flexible regulatory approach, as well as technical and commercial flexibility.

Governments and regulators should recognise that the IoT is a nascent industry and its value chain; its business models, markets and services, are fundamentally different from traditional voice and messaging. In most cases, IoT services have a closed user group, whereby open internet or any-to-any voice communications are not the primary purpose of the service. In addition, customers are generally not the service end-user, but a business that requires global distribution coverage and managed platforms for economic viability and the provision of consistent global services. Finally, these services are characterised by significantly lower average revenue per connection than traditional voice and messaging.

The IoT ecosystem and its value chain are composed of a large number of diverse players. Governments and regulators should ensure a policy framework based on fair regulation of equivalent services and that is technology neutral.

Regulation should avoid technology restrictions, while relying on competition. Excessive or technology biased regulation can stifle innovation, raise costs, limit investment and harm consumer welfare.

Privacy and data protection

To realise the opportunities that the IoT offers, it is important that consumers trust the companies who are delivering IoT services and collecting data about them. The GSMA and its members believe that consumer confidence and trust can only be fully achieved when users feel their privacy is appropriately respected and protected.

There are already well-established data protection and privacy laws around the world which have applied to mobile operators for years. The GSMA believes that it is possible to apply existing data protection regulations and principles to address privacy needs in the context of IoT services and technologies.

However, IoT services typically involve more parties than simply mobile operators, such as device manufacturers, online platforms and even the public sector. It is important that there is regulatory clarity and legal certainty around IoT services and that privacy and data protection regulations apply consistently across all IoT providers in a service and technology-neutral way.

Regulators should support and encourage measures by which industry can identify and mitigate risks to privacy, and through which they can demonstrate accountability e.g. through privacy enhancing technologies and tools that help consumers to manage their privacy and control how their data are used.

The data protection and security practices developed for a given IoT service should reflect the overall risk to an individual's privacy and the context in which data about the individual is collected, distributed and used. Any regulatory interventions should be limited to areas where identified risks emerge and existing measures are insufficient to address these.

The GSMA and its members draw on their extensive experience in addressing privacy and security issues and work collaboratively with their IoT partners, such as device manufacturers, mHealth and mEducation

service providers, to embed privacy and security into IoT technologies and the overall consumer experience. This on-going collaboration will ensure IoT industry partners are able to identify and mitigate the relevant consumer privacy risks in the context of the service being delivered.

Taxation

Governments should reduce or remove mobile-specific taxes because the resulting social impact and long-term positive impact on GDP, and hence tax revenues, will outweigh any short-term contributions to governments' budgets.

Taxes should align with internationally recognised principles of effective tax systems. In particular:

- **In general, taxation should be broad-based:** Taxation alters incentives for production and consumption, and so economic distortions will generally be minimised where the burden of taxation is spread evenly across the economy. In practice, this equates to adopting broadly defined bases for taxation, rate variations that are limited and effective enforcement of tax compliance.
- **Taxes should account for sector and product externalities³:** The case for taxation to address negative externalities, such as those arising from tobacco consumption, is well recognised. However the same logic also applies in the case of sectors and products with positive externalities.
- **The tax and regulatory system should be simple, easily understandable and enforced:** Uncertainty and a lack of transparency over taxation systems and liabilities may deter investors and are also likely to increase enforcement costs for government.

We have also identified that for IoT:

- **Dynamic incentives for investment should be unaffected:** Taxation should not disincentivise efficient investment or competition. In situations where the tax system fails to incentivise investment, economic growth, productivity and tax revenue could be significantly reduced in the long run.

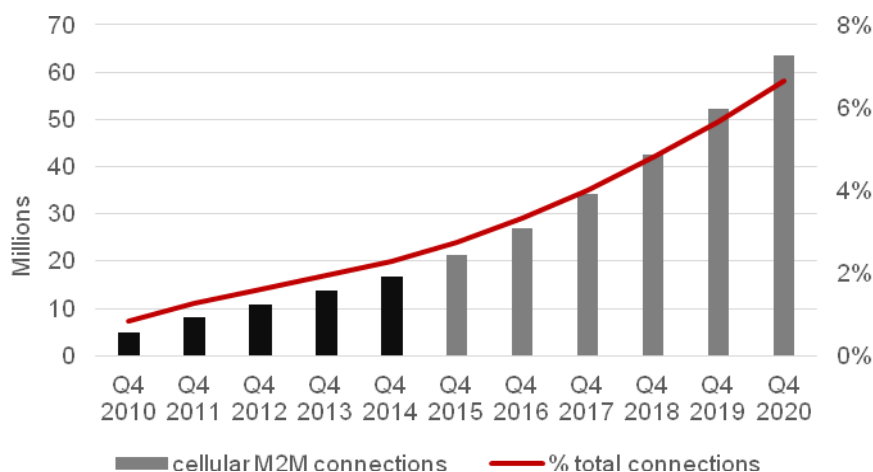
Taxes on IoT connected services and devices fail to meet many of these criteria. In particular, such taxes, if applied, are likely to be distortive, to deter investment and innovation, and to be detrimental to the development of IoT connected services. These concerns are discussed below, along with the potential ramifications for the sector and the wider economy.

Latin America markets review

There were 16.6 million cellular M2M connections in Latin America as of end-4Q 2014. M2M connection growth is expected to be strong over the next few years, at a compound annual growth rate (CAGR) of 25% to 2020, by which date the total number of connections will have reached 64 million. Across the region, M2M accounts for only around 2% of all connections; but this will rise to 7% by 2020.

Cellular M2M connections and M2M as proportion of total connections, Latin America, 2010 - 2020

³ Externalities are costs or benefits of a product that are not captured in the cost of that product. An example of a product with a negative externality is second-hand smoke from cigarettes: this adversely affects non-smokers, and unless cigarettes are taxed, the cost of this negative effect is not captured in cigarette prices. An example of a product with a positive externality is mobile communication: network effects mean that the value of owning and using a mobile device increases with the number of users; however the positive benefits for others are not reflected in the price that an individual is willing to pay for the service.



Source: GSMA Intelligence

The main M2M application categories, in Latin America, are the payment, automotive, and utilities industries. Brazil leads in terms of the adoption of cellular M2M in the Point-of-Sale (PoS) terminals, but PoS is an important vertical in a range of other countries in the region, such as Colombia and Chile. The automotive sector will be the major growth driver, over the forecast period, with applications such as vehicle tracking, fleet management as well as Original Equipment Manufacturer (OEM) embedded solutions continuing to increase in deployment terms.

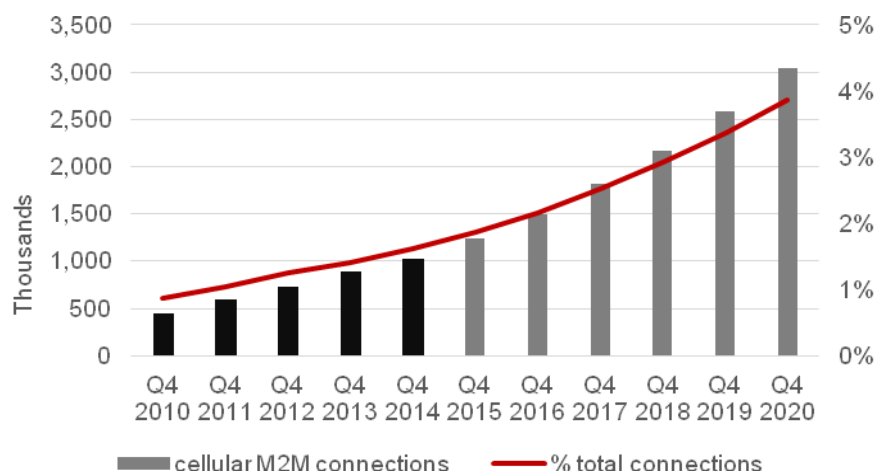
The utilities sector also has huge potential to embrace M2M centred solutions, however, operators in Latin America underscore that the adoption of smart metering depends on the readiness and willingness of utility companies to make investments into reducing non-technical losses, primarily from energy theft and fraud.

At the moment smart metering is at a nascent stage, but it offers a substantial opportunity for M2M. There are instances where activity is already increasing. For example, in Colombia operators are working on a project looking at putting together a “proof of concept” in relation to smart grids while operators in Chile “see utilities as major growth area for M2M.” The Brazilian energy regulator, ANEEL, is developing a national plan for smart grids, but has stipulated that smart meters should be deployed only to customers that request them.

Argentina

There were just over one million cellular M2M connections in Argentina at the end of 2014, with M2M accounting for 1.6% of total connections at the same time.

Cellular M2M connections and M2M as proportion of total connections, Argentina, 2010 - 2020



Source: GSMA Intelligence

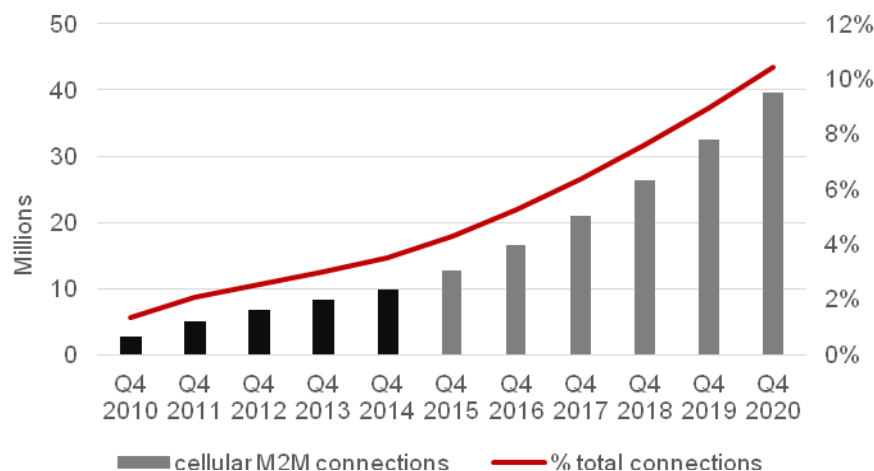
Security, payment and automotive are the main M2M applications in Argentina and are driving the M2M market.

Similar to other Latin America countries, PoS terminals are increasingly being connected using cellular networks. Also, mobile is the technology of choice when it comes to home security. Operators in Argentina are moving beyond offering connectivity only, and deploying M2M connectivity platforms.

Brazil

Brazil is the largest market in Latin America in terms of number of M2M connections. As of Q4 2014 Brazil had 9.9 million cellular M2M connections, accounting for 59% of cellular M2M connections in the Latin American region. M2M connections grew at a CAGR of 48% in the past four years, mainly driven by PoS terminals connected via GPRS and the migration of payment cards to the EMV standard (Europay, MasterCard and Visa).

Cellular M2M connections and M2M as proportion of total connections, Brazil, 2010 - 2020



Source: GSMA Intelligence

Operators in Brazil are moving away from being M2M connectivity-only providers.

- For example, in November 2012 Vivo launched a management platform for M2M (“Smart Center”), and in April 2013 the operator signed a M2M partnership agreement with Brazilian mobile resource management company Sascar to jointly develop fleet management services in the country.
- In summer 2012, insurance company Porto Seguro partnered with MVNE Datora Telecom and TIM Brasil to launch a M2M offer as the country’s first MVNO. This provides a service allowing it to track and monitor the driving habits of its customers. Porto Seguro ended April 2014 with almost 100,000 M2M connections, a 50-fold increase over its initial 2,000 customer base at the time of launch.
- Vodafone, in partnership with Datora Mobile, announced a contract with BMW Group for M2M services for the latest model in Brazil, the BMW i3. A Vodafone SIM card supports the Connected Drive technology of the vehicle, which allows access to the internet on a wide screen in the dashboard and interaction with smartphones from various applications and GPS navigation.
- Brazil is leading the way in terms of automotive M2M deployments. The majority of deployments to date are in the areas of vehicle and fleet tracking, and vehicle security, with the need to improve the efficiency of logistics networks being an important consideration in the region. These segments are expected to grow strongly out to 2020. Other applications will also see rapid growth, including more premium services such as pay-as-you-drive insurance and in-car infotainment services.
- Telefónica’s Vivo will provide M2M connectivity solutions for a smart grid and smart metering project in development for Brazil’s state-run power group Eletrobras. The operator was selected by a consortium formed by Siemens, Telemont and Itron, which won a public tender to develop a smart grid project for the state-owned utility. In addition to providing M2M technology, Vivo will be responsible for transferring data from all the meters to a control centre in Brasilia, and connecting it back to the regional centres of the six Eletrobras subsidiaries.

Tax reduction on M2M connections in Brazil

Recognising that its existing taxation policy on M2M connections was stifling growth, the Brazilian Government decided to significantly cut the levies it imposed on M2M SIM cards.

In May 2014, the Brazilian government passed a regulation approving tax breaks for M2M connections. The decree reduces two fees in the Telecommunications Inspection Fund (FISTEL):

- The Installation Inspection Tax (TFI), a one-off tax applied to all new connections when a SIM is first activated, from BRL 26.83 (USD 9.02⁴) to BRL 5.68 (USD 1.91);
- The Operation Inspection Fee (TFF), applied on an annual basis to all active SIM, from BRL 8.94 (USD 3.01) to BRL 1.87 (USD 0.63).

In both cases a reduction of almost 80%. Prior to the reduction in the tax rate on M2M connections, the Brazilian Government’s tax policy did not distinguish between M2M SIMs and traditional SIMs used by consumers for voice and data services. However, M2M connections produce a lower average revenue per unit (ARPU). Under certain circumstances, the high level of taxation meant operators would actually lose money on the provision of certain M2M connections. As a result, they had no incentive to support or invest in the market. Once the Brazilian Government recognised the risk, it decided to take action by introducing a tax cut.

In August 2014, ANATEL started to classify M2M terminals into two access categories:

⁴ All figures in USD use an exchange rate of end of April 2015 with Real of 1USD = 0.34 USD

- **Special M2M** are devices used in machine to machine communication systems which, without human intervention, use telecommunication networks in order to transmit data to remote applications aiming to monitor, measure and control the device itself, the environment around or data systems connected to it through these networks, according to what was established by the Decree 8.234/2014. The reduced Fistel tax applies to these terminals.
- **Standard M2M** are Machine-to-Machine devices in operation that don't match the definition of Special M2M.

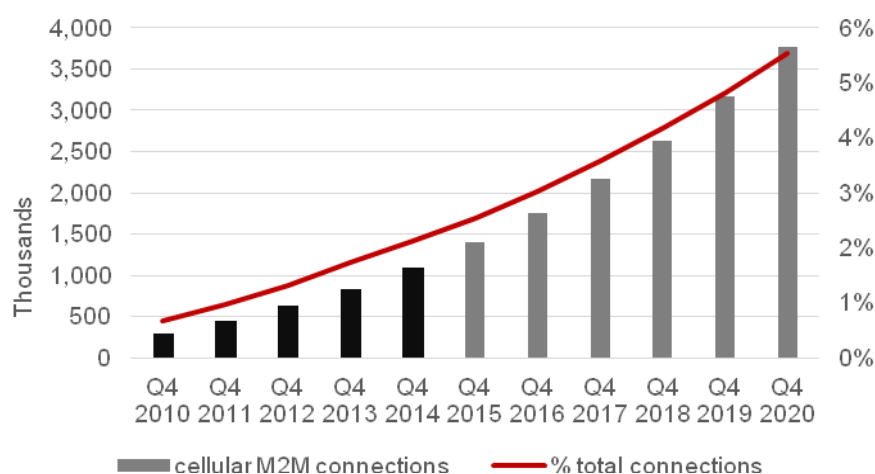
Since August 2014, special M2M, benefiting from the tax reduction, have grown by 26% while standard M2M only by 7%⁵. While it is still early, this is an initial encouraging sign that reducing taxes is an effective policy to support growth in M2M .

Reduced taxation can ultimately benefit public finances too. The tax reduction will hugely increase the take-up of M2M devices and services. This M2M growth has the potential to open up new streams of taxation revenue.

Colombia

There were almost 1.1million M2M connections in Colombia in 2014, accounting for 2% of all connection. Automotive, in particular fleet management is the largest M2M application, followed by PoS and security.

Cellular M2M connections and M2M as proportion of total connections, Colombia, 2010 - 2020



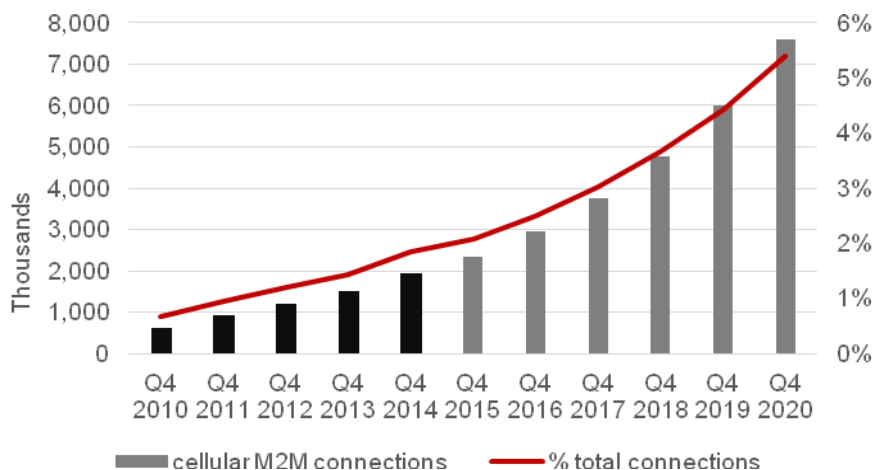
Source: GSMA Intelligence

Mexico

Mexico is the second largest market in Latin America, as of Q4 2014 it had 1.9 million cellular M2M connections, accounting for 12% of cellular M2M connections in the region.

Cellular M2M connections and M2M as proportion of total connections, Mexico, 2010 - 2020

⁵ ANATEL (2014)



Source: GSMA Intelligence

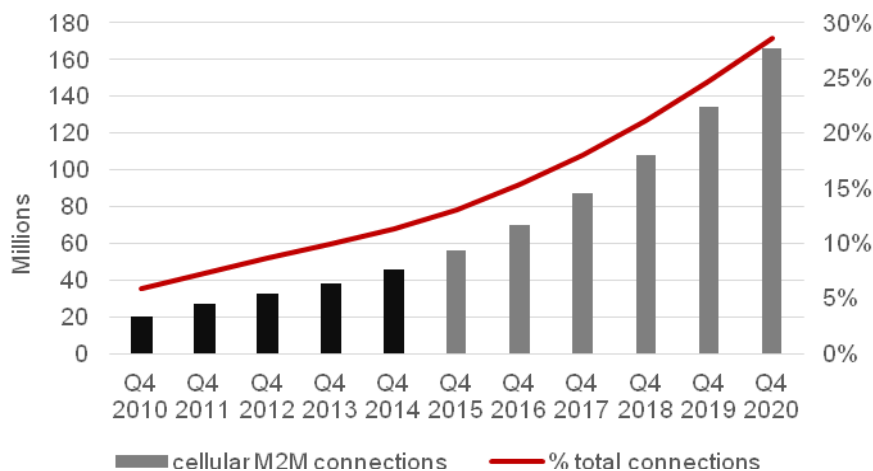
In Mexico, ‘track-and-tracing’ applications are the largest market, and other important segments are automotive and PoS.

- Mexican operators look to offer more than pure M2M connectivity. In November 2009, Telcel was one of the first operators’ in the region that partnered with Jasper Wireless, a global IoT platform leader.
- In 2012, Movistar started to provide end-to-end services in the M2M space. Movistar also plans to launch a management service that will allow its customers to monitor the consumption of MB per line.

Northern America markets review

Northern America has seen significant growth in the number of M2M connections over recent years. Going forward, the number of M2M connections in Northern America is expected to grow at CAGR of just over 20%, reaching a total of 166 million by 2020. Northern America accounted for almost a fifth of total global M2M connections at the end of 2014. In both the US and Canada, M2M connections accounted for just over 11% of total mobile connections in 2014.

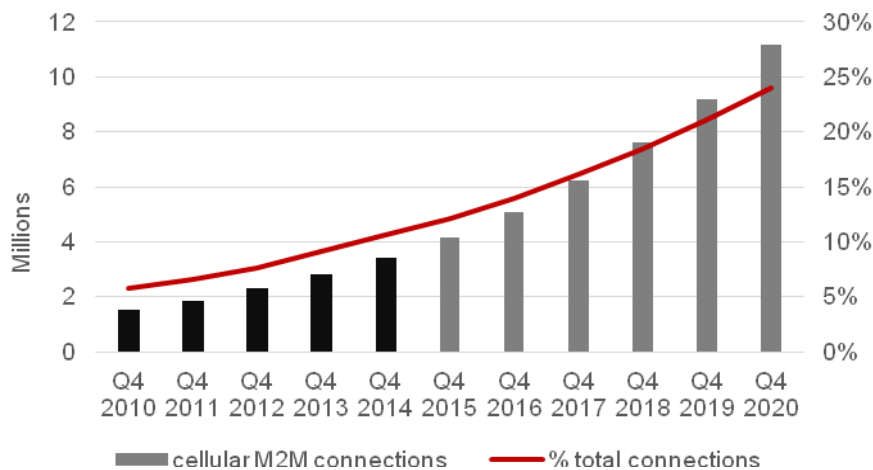
Cellular M2M connections and M2M as proportion of total connections, Northern America, 2010 - 2020



Canada

There were 3.4 million cellular M2M connections in Canada as of Q4 2014, accounting for almost 11% of total connections.

Cellular M2M connections and M2M as proportion of total connections, Canada, 2010 - 2020



Source: GSMA Intelligence

One of the largest M2M industries in Canada is transportation, as operators have partnered with automotive OEMs (e.g. Nissan Leaf deal with Rogers, OnStar with Bell Canada) and insurance companies to offer insurance telematics.

Security is also an important segment, with services expanding into an area of smart home. Smart metering is another sector, with a province-wide rollout in Ontario and additional deployments underway at leading utilities in Québec and British Columbia.

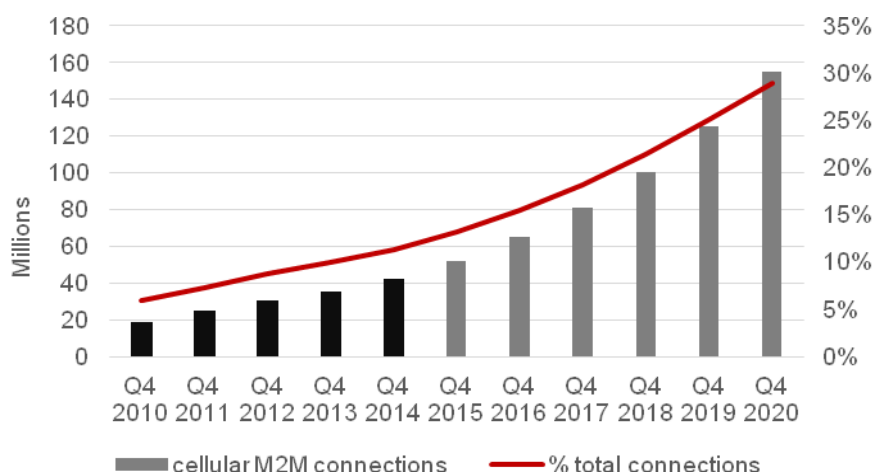
Operators are also joining multi operator alliances in order to ink global partnerships; in November 2013 Bell joined the Global M2M Association (GMA). The Global M2M Association is a service cooperation agreement in the M2M sector signed by Deutsche Telekom, Orange, Telecom Italia, and TeliaSonera. Meanwhile, Rogers was one of the seven operators which formed the Global M2M Alliance in July 2012.

United States of America

The US is one of the largest and most advanced M2M markets in the world. M2M accounts for one in ten of all mobile connections in the US. By contrast, the ratio in Europe and Oceania is one in 20, and only one in a hundred in Africa. There were approximately 42 million M2M connections in the US at the end of 2014, second only to China (69 million). In the US, M2M solutions and services are widely used in many different sectors of the economy. Utilities, automotive makers, logistics companies and the energy sector are all major users of M2M.

Home to many of the world's leading technology companies, the US is a far from typical M2M market. An array of start-ups, systems integrators, software companies and hardware vendors are very active in the US M2M sector, sometimes co-operating with mobile operators and sometimes competing with them. As they seek to address the specific needs of various vertical sectors, the US mobile operators are forming both strategic alliances and tactical partnerships with industry specialists

Cellular M2M connections and M2M as proportion of total connections, United States, 2010 - 2020



Source: GSMA Intelligence

Automotive

There is growing demand from both consumers and businesses for vehicles to use connectivity to reduce fuel consumption, maintenance and insurance costs, while increasing safety. Connected cars can help drivers to avoid congestion and take advantage of pay-as-you-drive insurance subscriptions, which offer lower premiums to safety-conscious motorists. Similarly, connected cars can call emergency services in the event of an accident and help manufacturers maintain an ongoing relationship with customers, providing proactive maintenance, for example. The US was one of the first countries in the world to deploy connected cars. General Motors' OnStar service, which connects vehicles to a range of services, was first launched in 1996 and has progressed to its ninth generation of hardware. Other automakers are also increasingly equipping mid-range and premium vehicles with connectivity. Automotive is also the main growth opportunity across connected car, fleet management, insurance telematics and V2X V2V (Vehicle to Vehicle) and V2I (Vehicle to Infrastructure)).

Smart meters

The US is moving fast to deploy smart grids that use connected smart meters to track energy consumption in real-time and enable a homeowner or business to remotely monitor their use of power. By the end of 2012, the 533 electric utilities in the US had installed more than 43 million smart meters of which 89% were in residential properties.

The major US telcos have long recognised that they need to offer far more than connectivity if they are to fully realise the opportunities presented by growing demand for M2M. AT&T and Verizon, for example, have both worked with specialist companies to develop sophisticated M2M platforms supporting, a range of business models, data analytics, global roaming and other advanced features.

In the US, the transition from 2G to 3G is taking place. New deployments of GPRS devices are on the decline and many existing devices have either been replaced or upgraded, due to the technology migration roadmaps announced by operators. Based on our research, 3G is currently the preferred replacement technology, with CDMA the main alternative for the most cost-sensitive applications. Our research shows that in 2014, 40% of M2M connections in Northern America used 3G networks, which we expect to increase to almost half by 2020.

GSMA publications on M2M/IOT

Latest publications

- **Realising the benefits of mobile enabled IoT (March 2015):** The report highlights the potential socio economic benefits that IoT can generate to governments, citizens, users and businesses. It also reviews an array of existing mobile-enabled solutions and determines how they are fundamentally changing business models, creating more opportunities and conserving resources.
Link: <http://www.gsma.com/connectedliving/news/new-pwc-report-mobile-networks-will-be-fundamental-to-enabling-the-iot/>
- **North America/US report (September 2014) :** This report investigates why the US is at the vanguard of M2M, the opportunities for further expansion and crucially how the operators themselves are unlocking more value for M2M customers.

Link: <http://www.gsma.com/connectedliving/gsma-driving-innov-connected-living/>

- **GSMA Connected Living Internet of Things Connection Efficiency guidelines (February 2015):** The predicted large scale growth of IoT devices and applications will create major challenges for the IoT ecosystem. One major challenge that the ecosystem must overcome is the risk caused by the mass deployment of inefficient, insecure or defective IoT devices which may lead to serious problems such as local congestion capacity and degradation. The GSMA has worked with its ecosystem partners to establish the GSMA IoT Device Connection Efficiency Guidelines for how machines should communicate via the mobile network in the most intelligent and efficient way.

Link: <http://www.gsma.com/connectedliving/iot-connection-efficiency/>

- **The market for smart wearable technology (February 2015)** Predicting rapid growth of the wearables market in the next few years and a unique role for operators to play in it. (A Wi Fore publication)

Link: <http://www.gsma.com/connectedliving/news/new-report-backs-mass-adoption-of-wearables/>

Others publications

- **Understanding the Internet of things – GSMA Connected Living paper,** link: http://www.gsma.com/connectedliving/wp-content/uploads/2014/08/cl_iot_wp_07_14.pdf
- **North America Mobile Economy**
<https://gsmaintelligence.com/research/?file=e4561f7e06a110c1d1596157c45ce1ef&download>
- **Latin America Mobile Economy:**
<https://gsmaintelligence.com/research/?file=64c663375c57810752d231640b7ee37f&download>
- **Cellular M2M forecasts and assumptions: 2010–2020 :**
<https://gsmaintelligence.com/research/?file=67b76e2ff86fa4cd7f11cf460e5d54dc&download>
- **M2M and MVNOs driving US connections growth:**
<https://gsmaintelligence.com/research/2013/08/m2m-and-mvnos-driving-us-connections-growth/397/>

Definitions

- **IoT:** Coordination of multiple vendor machines, devices and appliances connected to the Internet through multiple networks. Devices include everyday ‘objects’ such as consumer electronics, machines, vehicles, monitors and sensors equipped to support M2M services.
- **IoT Connected Services** are those delivered via devices where the connectivity is provided by authenticating a SIM and where the service has at least one of the following characteristics:
 - i. Open internet or open any-to-any voice communications are not the primary purpose of the service; mobile connectivity is utilised to deliver value-added functionality, or
 - ii. Services which have a closed user group and service provider managed connectivity which excludes open internet or any-to-any voice access.
- **M2M:** Devices and appliances connected wirelessly or via IP. In most cases, communication takes place with limited human intervention. M2M is an integral part of the IoT.

About the GSMA

The GSMA represents the interests of mobile operators worldwide. The GSMA unites nearly 800 of the world’s mobile operators with 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in industry sectors such as financial services, healthcare, media, transport and utilities. The GSMA also produces industry leading events such as Mobile World Congress.