LIME Response to

Decision on a Policy for the Assignment of 700 MHz Spectrum (ICT Decision 2012-4)

REDACTED

Contents

1 Executive Summary

Cable and Wireless (Cayman Islands) Limited, trading as LIME ("**LIME**") is pleased to submit the following application for 700MHz spectrum, pursuant to paragraph 22 of the Authority's Decision 2012-4.[1] As detailed below, LIME is applying for the Lower Blocks B and C, for a total of 24 MHz paired.

Block B (Lower)	704-710 734-740	12 MHz Paired
Block C (Lower)	710-716 740-746	12 MHz Paired

Use of this spectrum and deployment of LTE technology is a critical component of LIME's comprehensive strategy to develop first-world-quality high-throughput, low-latency mobile broadband services. LIME will also use this spectrum to support its long-standing commitment to erase the digital divide in this country, and to bring new and enhanced ICT services to all Caymanians.

LIME was the first operator to reach another key milestone in Cayman's history by launching HSPA+ in 2011. Since the launch of this technology, we have experienced an unprecedented demand for mobile data and further investments have been made, adding new mobile capacity, to meet Cayman's insatiable appetite for data.

Allocating the 700MHz spectrum hereby requested, will result in LIME making another wave of significant investments that will reposition mobile connectivity and open broader applications and possibilities in the areas of e-health, e-learning, e-government, national security and cloud based services to name a few. This development will aid the economic and social well-being and growth of the country and stimulate new areas of innovation in government for example, driving more efficiencies, and in the private sector, LTE will allow Cayman to further advance its competitive edge as well.

Our strategic approach has always sought to make the most efficient use of limited resources, such as wireless spectrum, and our application will also show that LIME is also already investing in other technologies to augment the deployment of LTE. We do note as well however that today LIME is already at a disadvantage in terms of spectrum allocation, and we believe this process presents an opportunity for the Authority to address this inequity as well while securing a most robust future-proof mobile network for Cayman.

We have leveraged our regional and global resources as well as key supplier relationships to evaluate LTE for Cayman. Our senior leadership is committed to the Cayman market in particular given its long-standing record of needing first-world technologies and services in a timely manner.

[1] ICT Decision 2012-4, "Decision on a Policy for the Assignment of 700 MHz Spectrum (CD 2012-2)", 13 December 2012.

We remain committed to Cayman's future, Cayman's success, the people of Cayman and our mission, ***"To understand, serve and deliver to government, business and families"***.

1.1 Structure of Application

As required by Decisions 2008-1[2] and 2012-4, LIME has addressed the following matters in the referenced sections of this document

a. The spectrum will be used to provide, directly or indirectly, new or enhanced ICT services which will be of benefit to the Cayman Islands. (Section 3)

b. The new or enhanced services will be commercially launched within a timescale acceptable to the Authority. (Section 3)

c. Efficient use will be made of the spectrum. (Section 5.4)

d. This use of the spectrum will not cause interference with the systems of other Licensees or third parties. (Section 5.5)

e. This use of the spectrum is consistent with the allocations recommended for ITU Region 2. (Section 5.4)

f. The assignment will not adversely impact the development of competition in the ICT sector. (Section 3.5)

g. The proposed network build out timeframe, (Section 5.2)

h. The technical specifications of the proposed network, (Section 5.1)

i. The proposed 700MHz band, and (Section 5.3/5.4)

j. The proposed network layout for the Cayman Islands. (Section 5.1)

[2] ICT Decision 2008-1, "Decision and Further Process – Policy for the Management and Allocation of Spectrum in the Cayman Islands", 6 March 2008.

2 The Applicant

Cable and Wireless (Cayman Islands) Ltd. T/A LIME has been operating in the Cayman Islands for over 45 years as a full service provider and we have a proud and distinct track record of investing in critical infrastructure, services and training that has underpinned significant economic and social development around the world. As a part of Cable & Wireless Communications we have a long history of providing services now for well over 100 years, being pioneers in many instances. We are the only full-service provider in most of our markets. Our Group headquarters is in London, where the Company is listed on the London Stock Exchange.

Across the world, Cable & Wireless' core focus for future growth is on high-speed mobile data services, and IP (Internet Protocol) and data services and solutions for residential and business customers with key government partnerships that also enable sustainable social, economic and educational growth. In support of this strategy, we have developed advanced mobile and IP networks with value-added services in many countries. With clear financial strength, solid leadership, commitment, proven expertise and a first-world network, we hold a unique position in terms of global coverage and an extensive portfolio of services.

We are a global company and lead the market in 21 out of the 27 markets in which we currently offer mobile services, 25 out of the 28 markets in which we currently offer fixed broadband and 25 out of the 27 markets in which we currently offer fixed line voice services. We operate in a range of developed and developing territories.

In many of our operations we partner with governments as well as corporate and public investors. Within each business unit we are a trusted provider of services to the local communities, nations and regions in which we operate. This is a role we take seriously and our businesses pride themselves on being able to work effectively with governments, regulators and other partners in each of our territories.

As of 30 September 2012, Cable & Wireless Communications, through its subsidiaries and joint ventures, provided services to approximately 11.3 million mobile, 1.7 million fixed line customers and 667,000 broadband customers.

Cable and Wireless (Cayman Islands) Ltd. T/A LIME has been operating in the Cayman Islands for over 45 years. We are the only '360' provider in that we provide all traditional telecommunication services (fixed, mobile, broadband, international data, CPE, telex, international submarine connectivity, etc) across all three islands and we continue to invest in the latest cutting-edge technology. Our aim is to ensure that our customers are able to take advantage of the latest innovation so that Cayman as a country is able to compete globally and from an educational and developmental standpoint we aim to eliminate the possibility of a digital divide.

During our years in the Cayman Islands, we have made substantial capital investments in developing and expanding services to keep pace with, and contribute to, the countries' development, and today the Company is the pre-eminent provider of fixed and mobile voice, data and Internet services in the Cayman Islands.

Product and Service Choices

Fulfilling the needs of the key pillars of our economy (finance & tourism) government needs and other commercial sectors' expanding needs, we offer Cayman's most extensive range of services. These include mobile telephone service, 4G (HSPA+) mobile data services, DSL High Speed Internet access, Dedicated Internet Access, IP-VPN Managed Router and Managed Firewall products, International Private Leased Circuits (IPLCs), voice & fax mail, toll-free 800 services, leased circuits, calling card and payphone services, and a wide range of PBX/CPE equipment for businesses as well.

Despite the market being liberalized back in 2003, we are still the only telecommunications operator in the Cayman Islands that has, to date, actually rolled out all of its services to all districts across the country. LIME, therefore, has demonstrated its commitment to the growth and development of the entire country, and not just a limited corridor along Seven Mile Beach and George Town. We remain committed to being a strong, strategic long-term partner in Cayman and we will undoubtedly play a pivotal role in the next wave of developmental changes to help move the Cayman Islands beyond the current global economic crisis.

Our vision is "Making Caribbean life better" and while we have a proud history of making major investments in critical infrastructure and technology in the Cayman Islands and indeed across the world, we have also been making major investments in our colleagues, across Cayman's communities for over four decades, and we support a long list of non-profit organizations each year. True to our promise, we will continue "Connecting People. Building Communities" and our contribution has undoubtedly shaped many successful Caymanian careers and ventures and aided thousands of families over the years.

Today we are a vibrant, competitive, nimble, innovative, and caring partner, and remain committed to many key projects and endeavours that demonstrate our resolve, our presence and long-standing testament as one of Cayman's top employers and investors. Some of our latest engagements are shared briefly below.

Our Colleagues – We remain dedicated to the development of Caymanians and in particular our colleagues, our most valuable resource. Each year, hundreds of thousands of dollars are spent on training to ensure our staff are equipped with the latest skills across numerous disciplines including technology, sales, marketing, accounting, legal, management and leadership. Our legacy endures, and we shall remain a top investor in our people.

The Environment – LIME staff joined numerous businesses and organizations along Cayman's roadsides and beaches on Earth Clean Up Day (see picture below)

The Culture - We appreciate and support Cayman's culture. Hence our Platinum partner sponsorship of Cayman Carnival Batabano for over 10 years now, which brings together the Cayman Islands' history with its love for music, dancing and having a good time.

Education – We have long provided free broadband services to most public and private schools across the Cayman Islands, over 40 in total, ensuring the latest educational delivery and enhancement mechanisms are available to all students in Cayman. In addition, LIME provides free Internet services in all of Cayman's public libraries.

The Youth – We support youth development across Cayman. This is reflected in its sponsorship of the Lighthouse School Summer Camp, which targets physically and mentally challenged students.

Sports – We support numerous sporting activities such as the 25th annual LIME 800m Sea Swim took place on Saturday 12th May 2012. A total of 145 swimmers swam the course with ages ranging from 5 to 85. The LIME Sea Swim is the first event to kick off the open sea swim season each year. LIME also sponsored the 'Jet Around Cayman' ski race.

We remain committed to the long-term development of the Cayman Islands and we will continue to give back to the communities and foster sustainable development.

Our key investments over the years represent a long list of well-known milestones and hundreds of millions of dollars. A few of these are listed below:-

- 1966 - Cable & Wireless commences operations in Cayman
- 1867 – Cayman Brac Exchange opens
- 1972 – First international cable system connecting Cayman - Jamaica
- 1975 – George Town cross-bar exchange installed, major upgrade to earlier technology

- 1979 – Standard-B earth station installed
- 1980 – New digital exchange implemented in Cayman
- 1980 – New telex exchange goes live
- 1984 – Grand Cayman – Cayman Brac cable system commissioned
- 1987 – Cable & Wireless provides mobile services across Cayman
- 1988 – Sister islands receive digital telephone exchange
- 1991 – First terrestrial fibre system installed in Cayman
- 1996 – Cayman – Jamaica (CJFS) fibre system goes live
- 2000 – MAYA 1 Cable system goes live
- 2011 – First operator to provide 4G (HSPA+) services in Cayman
- 2013 – # #

We believe LIME's investment record positions us well for the future and in particular where technologies such as LTE are concerned whereby a selection process will likely favour a single operator. LIME has demonstrated over the past five decades that its investment strategy in the Cayman Islands relies heavily on long-term commitments representing nation-wide deployments and benefits that all can receive. We remain committed to this strategy.

3 New Enhanced ICT Services

With advances in Cayman Islands data services such as fibre optic connectivity, consumers and businesses in, and visitors to, the Cayman Islands will benefit from the extended speeds of fixed broadband services. However these fixed broadband services need to be complemented as a result of the nomadic nature of people's lives. LTE's economic benefits are grounded in the new capabilities it has to offer. Higher-bandwidth and lower-latency will significantly improve the user experience for bandwidth-hungry content and applications.

LTE's all-IP architecture, spectral efficiency and bandwidth flexibility promise to improve overall network economics to the benefit of all Cayman Islands users. "Performance-sensitive" segments such as businesses are looking at mobile applications that can help speed up productivity and efficiency. This translates into the need to focus intently on understanding the needs of customers, anticipating the types of services and applications that will be demanded by end users in the 4G LTE environment.

Cayman's population remains one of the most diverse in the world with telecommunications demands being on par with the most developed nations. A critical driver behind Cayman's telecommunications evolution and growth has therefore come from multinational organizations who have experienced the latest technologies and are set to ensure that, as they move to and operate from Cayman, they are able to compete globally.

The Cayman Islands also benefits immensely from an extraordinarily large influx of tourists each year with arrivals in 2012 amounting to 1.829M visitors predominantly from North America where LTE has already been widely deployed. Increasingly this large base will be seeking out LTE networks as they roam as well, hence helping to drive the commercial case to deploy it.

3.1 Description of Planned ICT Services

LIME plans to use the 700MHz band for LTE services. Given the 12*12MHz assignment, LIME intends to use a profile of #

faster than HSPA+ technologies today.

The services to be provided via 4G LTE at 700 MHz encompass:

- #

Overall a global mobile data explosion is taking place and LIME needs to be in pole position to deliver the much-needed infrastructure for the Cayman Islands.

Globally mobile data traffic grew 2.6 fold in 2010 alone and it is expected to jump by 26 fold by 2015, and it will be comprised of mainly mobile video, some 55.4% based on a 2011 Cisco VNI Mobile 2011 report. However, today in Cayman, LIME is experiencing far faster growth, and its customers are generating exponential demand for data as depicted in the chart below.
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3.2 Investment Strategy: New Areas of Focus

The technological capability of LTE also allows the opportunity for new and exciting public services to be put into operation. These new services have the potential to generate jobs, reduce public costs , increase public safety, and overall increase the quality of life in the Cayman Islands. A few areas that could be integrated into LTE wireless broadband as per the FCC's national broadband plan that could have application in the Cayman Islands are as follows:

- #

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3.3 Benefits to SMEs and Industry

The conduct of key business activities such as communication, collaboration, process enhancements and transactions is made easier by use of broadband applications such as online conferencing, social networking, cloud-based business software and e-commerce. Perhaps chief among the benefits of broadband for business is that it allows small businesses to achieve operational scale more quickly. Broadband and associated ICTs can help lower company start-up costs through faster business registration and improved access to customers and suppliers.

Broadband also gives SMEs access to new markets and opportunities by lowering the barriers of physical scale and allowing them to compete for customers who previously turned exclusively to larger suppliers. E-commerce solutions eliminate geographic barriers to getting a business's message and product out to a broad audience. The transition to LTE can have the effect of spurring new ideas, demand for these ideas and finally the businesses and jobs they eventually spawn. While the market is still creating new innovations for use with this technology there are already established sectors that have grown around high-speed mobile broadband.

As its availability becomes more ubiquitous and the market reaches a critical level of smartphone penetration, it can give way to the thriving market for application developers. While the worldwide app development industry is huge, Caymanian apps made for Caymanians by Caymanians should begin to see spikes in demand once the market sophistication becomes such that it would be appreciated. The transition to LTE provides the infrastructure that is the first step, particularly as LTE would allow ICT based or dependent industry to be based anywhere in the Cayman Islands. As the deployment of LTE networks proceeds, the extension of advanced mobile communications could cause an increase in the number of businesses retained, relocated, and started in outlying communities and stimulate even broader economic growth in Cayman.

3.4 Impact on Market

The development of the new services and capabilities discussed above will have a beneficial impact on the market. Not only will consumers benefit from the innovation, LIME expects that other operators will also seek to innovate in response. LIME notes, however, that a decision to assign the spectrum being requested will also help redress a competitive imbalance in the market for mobile telephone services in the Cayman Islands.

As the Authority is aware, spectrum is critical to a mobile operator's ability to provide quality services to customers, and inability to access an adequate amount of spectrum will negatively impact an operator's competitive position. A review on 28 February 2013 of the Annex 4 of the Digicel and LIME ICT Licences shows a significant disparity in the spectrum assigned to the two companies for "Mobile Telephony" services. These are summarized in the tables below.

Band	Frequency	Amount
850	841 to 8148 MHz 886 to 893 MHz	7 x 7 MHz
900	895 to 902 MHz 940 to 947 MHz	7 x 7 MHz
1800	1 730 to 1 739.8 MHz 1 825 to 1 834.8 MHz	9.8 x 9.8 MHz
1900	1 895 to 1 904.8 MHz 1 975 to 1 984.8 MHz	9.8 x 9.8 MHz

2100	1 930 to 1 940 MHz 2 120 to 2 130 MHz	10 x 10
Total		**43.6 x 43.6 MHz**

Digicel Authorised Frequencies

Band	**Frequency**	**Amount**
850	824 to 839 MHz 869 to 884 MHz	15 x 15 MHz
1900	1 870.2 to 1 884.8 MHz 1 950.2 to 1 964.8 MHz	14.8 x 14.8 MHz
Total		**29.8 x 29.8 MHz**

LIME Authorised Frequencies

It is immediately apparent that Digicel has 46% more spectrum, in terms of total MHz available to it, than LIME. In addition, Digicel is operating in five separate spectrum bands while LIME is operating in two. This gives Digicel a significant competitive advantage in both the domestic and the inbound roaming markets. Nor is this competitive advantage a recent development. In its April 2011 application for spectrum, for example, LIME highlighted the fact that LIME only had 28.6 MHz paired (prior to the spectrum requested in that application), compared to Digicel's 33.8 MHz paired. In other words, Digicel's spectrum advantage, and therefore the competitive imbalance in this market, actually increased between 2011 and 2013.

Assignment of the Lower B&C 700 MHz blocks would help redress this situation by bringing LIME's total allocation up to a total of 41.9 MHz paired. This is still less than Digicel's total allocation, but much more in line with their 43.6 MHz paired, and would help promote fair and sustainable competition in Cayman.

Further, assignment of the Lower B&C 700MHz Blocks to LIME would not harm competition in Cayman, or prevent competitors from rolling out their own LTE networks. LIME notes, for example, that Digicel has already been assigned spectrum to deploy a 10MHz profile LTE network using 3GPP Band 1, i.e. the 10 MHz of 2100 MHz Band spectrum. This means that Digicel could offer LTE services using their existing assignments, without impacting services provided to existing customers, especially as they are serving approximately the same number of customers as LIME using more spectrum than LIME (even without including the 2100MHz assignment). LIME, however, requires an additional assignment in order to deploy LTE services: LIME is already using all of its 850MHz and 1900MHz spectrum to provide GSM and HSPA+ services, and any use of that current assignment for LTE services would necessarily be customer impacting.

Based on the foregoing, assignment to LIME of the Lower B&C Blocks of the 700 MHz band will enhance competition for mobile services in the Cayman Islands, whereas assignment to Digicel would foreclose competition.

4 High-level Deployment Plans

LIME plans to introduce LTE services to the Cayman Islands within a # # timeframe following assignment of spectrum. This approach falls in line with what LIME understands as the expectations of the Authority and the market. Previous LTE deployments around the globe have suffered a lack of advance planning and experienced criticism. However LIME intends to ensure these lessons are leveraged to be able to deliver a full and satisfying experience to the businesses, consumers and visitors to the Cayman Islands.

LIME has planned a phased approach to the roll-out of services, and the diagrams below depict what LIME believes as the geographic priority for a commercial launch:
#

#

In order to minimize the construction of new towers and the resulting impact on the landscape, LIME will seek as much as possible to use its existing sites.

Phase 1 will include #

of the population.

Phase 2 will add #

of the population.

Phase 3 will complete the planned rollout by extending the LTE coverage to #

#.

LIME plans a #

#.

New sites will be added as needed in the future to expand this coverage. LIME will also #

#.

LIME is clearly committed to delivering a #

#.

5 Technical Specifications of proposed Network

5.1 LIME's Approach to Cost Efficient Coverage and Capacity for Cayman

Mobile broadband traffic is growing rapidly – especially in Cayman, driven by the increasing popularity of connected devices, such as smart-phones and tablets. Consumers have come to expect a consistent, high-quality and seamless mobile broadband experience wherever they are.

Meeting these expectations is a key priority for LIME looking to differentiate itself in the networked society of Cayman and ensure Cayman is known as a connected country, in which everything that can benefit from a connection will be connected. To provide the right mobile broadband experience, networks need sufficient capacity and coverage to deliver high data throughput with very low latency. #

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To prepare networks for surging traffic demand, LIME will #

its existing networks, as well as broader market, technical and economic considerations.

One size does not fit all, Cayman is unique, and flexibility is needed to ensure that customer expectations are met in the most cost effective, spectrum-efficient and future-proof way.

Radio spectrum is a limited resource and one of the most strategic and important investments. Naturally, this fact leads to a demand for spectrum to be used as efficiently as possible – especially in densely populated areas such as George Town.

The performance of #

is enabled by efficient spectrum reuse across layers and radio coordination functionality.

Designing #

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#

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5.2 LIME Cayman LTE Core Network

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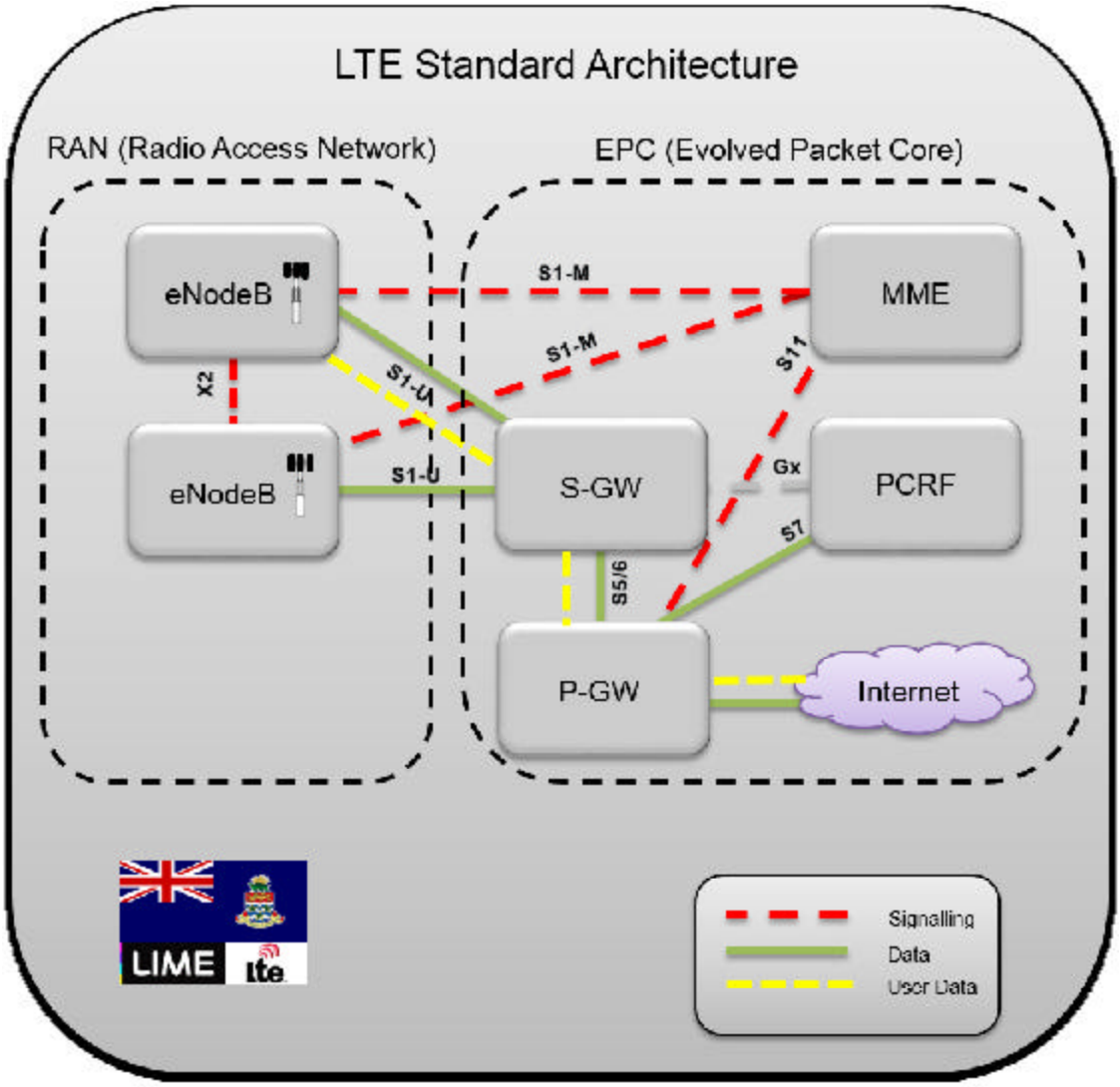
#. This ensures cost effectiveness due to the scale of consumers in comparison to other countries.

The Planned Cayman LTE network is best described by dividing two areas, namely the Core network called an EPC (Evolved Packet Core) and the Radio Access Network (RAN), which for LTE is called the eUTRAN. The diagram below shows a standard LTE architecture with its main components.



The main node functions are:

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The technical overview of LIME's planned LTE network leverages the architecture of our existing operation along with conforming to 3GPP standards, but with the addition of new LTE nodes as depicted in the diagram below:
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The eNodeB's are the base stations (RAN) with the other nodes being part of the EPC. The diagram shows the various 3GPP standard interfaces and how they connect along with the data traffic flow. Typically #

#. The diagram below shows the LIME network with its nodes that will be upgraded.
#

#

5.3 LIME Cayman LTE Radio Access Network

The radio access network will use state of the art, world leading technology. #

The diagram below depicts how this would be installed;
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#

LIME will utilize up to #

#.

The # # and consumes very little power in comparison to traditional large baseband units. Each of the # # components are;

- #

#

#

#

#

The ## has been specified to be able to handle future expansion for Cayman should there be a requirement to increase the receiver sensitivity in particular areas. #

#. This may be required in a few locations with poor indoor coverage. LIME will be conducting drive tests to ensure the correct configuration is used on each site.

The maximum throughput per sector will be #

#..

Thus each site configured with this profile and using #

uplink.

5.4 Proposed Network Build out Timeframe

LIME anticipates a # # rollout for its proposed LTE network. The following diagram shows a high level plan for the site and core build. This does not include other activities such as marketing and training, which can be integrated at the same time. #

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#

#

Items such as the transmission are #

#. Installation of these items normally take time,

#.

5.5 LIME Preference on Lower B&C Blocks

LTE spectrum is broken down by 3GPP into numbered bands. The table below shows the spectrum band numbers and their corresponding frequencies (there are

actually over 44 bands; however the main FDD bands as applicable to LIME's application are highlighted below).

Band	Name	Bandwidth (MHz)	Downlink (MHz)		Uplink (MHz)		Duplex spacing (MHz)
			Low Earfcn	High Earfcn	Low Earfcn	High Earfcn	
1	IMT 2.1 GHz	60	2110 0	2170 599	1920 18000	1980 18599	190
2	PCS 1900	60	1930 600	1990 1199	1850 18600	1910 19199	80
3	DCS 1800	75	1805 1200	1880 1949	1710 19200	1785 19949	95
4	AWS	45	2110 1950	2155 2399	1710 19950	1755 20399	400
5	850 MHz	25	869 2400	894 2649	824 20400	849 20649	45
6	UTRA only	10	875 2650	885 2749	830 20650	840 20749	45
7	2.6 GHz	70	2620 2750	2690 3449	2500 20750	2570 21449	120
8	900 MHz	35	925 3450	960 3799	880 21450	915 21799	45
9	1700 MHz	35	1844.9 3800	1879.9 4149	1749.9 21800	1784.9 22149	95
10	Extended AWS	60	2110 4150	2170 4749	1710 22150	1770 22749	400
11	1.5 GHz Lower	20	1475.9 4750	1495.9 4949	1427.9 22750	1447.9 22949	48
12	700 MHz Lower, A+B+C	17	729 5010	746 5179	699 23010	716 23179	30
13	700 MHz Upper	10	746 5180	756 5279	777 23180	787 23279	-31
14	Public Safety	10	758 5280	768 5379	788 23280	798 23379	-30
17	700 MHz Lower, B+C	12	734 5730	746 5849	704 23730	716 23849	30
18	Japan 800 MHz lower	15	860 5850	875 5999	815 23850	830 23999	45
19	Japan 800 MHz upper	15	875 6000	890 6149	830 24000	845 24149	45
20	800 MHz EDD	30	791 6150	821 6449	832 24150	862 24449	-41
21	1.5 GHz Upper	15	1495.9 6450	1510.9 6599	1447.9 24450	1462.9 24599	48
22	3.5 Ghz	80	3510 6600	3590 7399	3410 24600	3490 25399	100
23	2 GHz S-Band	20	2180 7500	2200 7699	2000 25500	2020 25699	180
24	L Band	34	1525 7700	1559 8039	1626.5 25700	1660.5 26039	-101.5
25	PCS 1900 + G Block	65	1930 8040	1995 8689	1850 26040	1915 26689	80

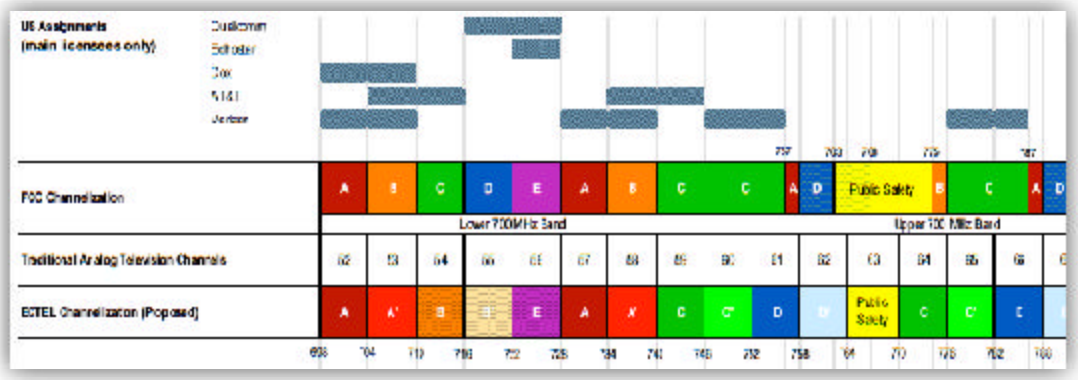
26	800 MHz iDEN	**35**	859 8690	894 9039	814 26690	849 27039	45
27	850 MHz lower	**17**	852 9040	869 9209	807 27040	824 27209	45
28	700 MHz APAC	**45**	758 9210	803 9659	703 27210	748 27659	55
33	TDD 2000	**20**	1900 36000	1920 36199			TDD
34	TDD 2000	**15**	2010 36200	2025 36349			TDD
35	TDD 1900	**60**	1850 36350	1910 36949			TDD
36	TDD 1900	**60**	1930 36950	1990 37549			TDD
37	TDD PCS	**20**	1910 37550	1930 37749			TDD
38	TDD 2.6 GHz	**50**	2570 37750	2620 38249			TDD
39	China TDD 1.9 GHz	**40**	1880 38250	1920 38649			TDD
40	China TDD 2.3 GHz	**100**	2300 38650	2400 39649			TDD
41	TDD 2.5 GHz	**194**	2496 39650	2690 41589			TDD
42	TDD 3.4 GHz	**200**	3400 41590	3600 43589			TDD
43	TDD 3.6 GHz	**200**	3600 43590	3800 45589			TDD
44	700 MHz APAC	**100**	703 45590	803 46589			TDD

LTE Spectrum Bands

Given the location of the Cayman Islands, various spectrum alignments locally to USA FCC on spectrum and volume availability of LTE devices, existing and potentially new roaming partners, LIME wishes to adopt a US-based approach to spectrum for LTE. This falls in line with the Authority's band plans for 700MHz spectrum.

The USA currently has two main operators in LTE, namely Verizon and AT&T both using 700MHz spectrum. The 700MHz spectrum was awarded after "Auction 73" in January 2008 based on the "Digital Dividend" of change from analogue TV (Channels 52-69) to Digital TV.

The following table represents the spectrum assignment output from Auction 73:



FCC Band plan and block allocation

The FCC Auction 73 covered the following five blocks of the UHF spectrum:

- Block A: 12 MHz bandwidth (698–704 and 728–734 MHz)
- Block B: 12 MHz bandwidth (704–710 and 734–740 MHz)
- Block C: 22 MHz bandwidth (746–757 and 776–787 MHz)
- Block D: 10 MHz bandwidth (758–763 and 788–793 MHz)
- Block E: 6 MHz bandwidth (722–728 MHz)

A comparison of the Verizon and AT&T frequency assignments with 3GPP LTE bands shows that Verizon has Band 13 and AT&T Band 17.

There is however one distinct differentiator that causes issues with device manufacturers – Band 17 and Band 13 has opposite Uplink and Downlink, i.e. the lower set of frequencies of the AT&T band is used for the Uplink while the lower set of frequencies of the Verizon band is used for the Downlink.

	Uplink	Downlink
AT&T (Band 17)	704-716 MHz	734-746 MHz
Verizon (Band 13)	776-787 MHz	746-757 MHz

AT&T and Verizon frequency allocation USA

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Several manufacturers have launched LTE devices and have plans to cover more bands. Recently (September 12th 2012), Apple announced their iPhone 5. This specification is likely to lead the development of many handset manufacturers and is similar to those currently available.

New iPhone 5 Spectrum specifications:

GSM model A1428*: UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 4 and 17)

CDMA model A1429*: CDMA EV-DO Rev. A and Rev. B (800, 1900, 2100 MHz); UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 3, 5, 13, 25)

GSM model A1429*: UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 3, 5)

Band 1 – 1920-1980 MHz / 2110-2170 MHz (Europe)
Band 3 – 1710 – 1785 MHz / 1805-1880 MHz (USA/Canada)
Band 4 – 1710 – 1755 MHz / 2110-2155 MHz (USA/Canada)
Band 5 – 824-849 MHz / 869-894 MHz (Europe)
Band 12 – 698 – 716 MHz / 728 – 746 MHz (USA)
Band 13 – 777 – 787 MHz / 746 – 756 MHz (USA)
Band 17 – 704 – 716 MHz / 734 – 746 MHz (USA)
Band 25 – 1850 – 1915 MHz / 1930 – 1995 MHz (Europe)

Most of the current USA device market supports GSM/LTE (i.e. the AT&T standard) as these handsets can roam internationally.

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5.6 Proposed use of 700MHz Spectrum

The diagram below shows LIME's proposed use of the lower blocks B&C in conformance to ITU Region 2 standards. It also depicts a potential issue with the alignment of Block A to 3GPP standards.

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The top row of the diagram shows the Authority's planned block allocations, which are in line with the legacy TV signal allocations and the FCC band plan.

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5.7 Interference to other operators

LTE is the most advanced form of mobile telephony radio and as such benefits from the use of digital radio technology. This means that the radio caters for optimum use of spectrum, reducing side-band emissions. The diagram below shows LIME's planned use of the spectrum, along with a measurement taken in a recent technology trial.

Note: The measurement was taken in Band 13, however similar results would apply in Band 17, due to conformance to 3GPP standards.

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As shown, the benefits of LTE can be seen to be taking optimum use of the spectrum with minimised side band emissions delivering the most to the consumer and no side band emissions outside of that catered for in blocks B&C. Together with the planned 1MHz guard band on either side of the 10MHz profile, this means there is no potential interference by LIME with adjacent spectrum users.

6 Conclusion

LIME has considered this opportunity carefully and considers the introduction of LTE to be a significant development that will accelerate the further enhancement of lives in the Cayman Islands in a number of different ways. #

and we are pleased to submit this application in response to the Authority's Decision on the Policy for the Assignment of 700MHz Spectrum.

LIME is dedicated to the long-term growth and success of the Cayman Islands and our many successes and historic investments have no doubt helped to underpin the astounding success that Cayman enjoys on the world stage today. We genuinely believe that our submission presents sufficient support for this next level of development. We stand ready with the requisite resources, experience and determination to lead as one of Cayman's top investors in infrastructure, services, innovation and its people.

We believe that we have presented a clear case for LTE in Cayman, and furthermore, #

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LIME hereby seeks a timely response from the Authority on this particular aspect of the process and we are prepared for further engagement should this process lead to an even more extensive review in the event that another party may be requesting the same spectrum.

We have a strong track record of making solid long-term strategic investment decisions and if given the opportunity to deploy LTE through the use of 700MHz spectrum, LIME will once again demonstrate commitment #

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