

ROADMAP

Connected Latin America & Caribbean 2020

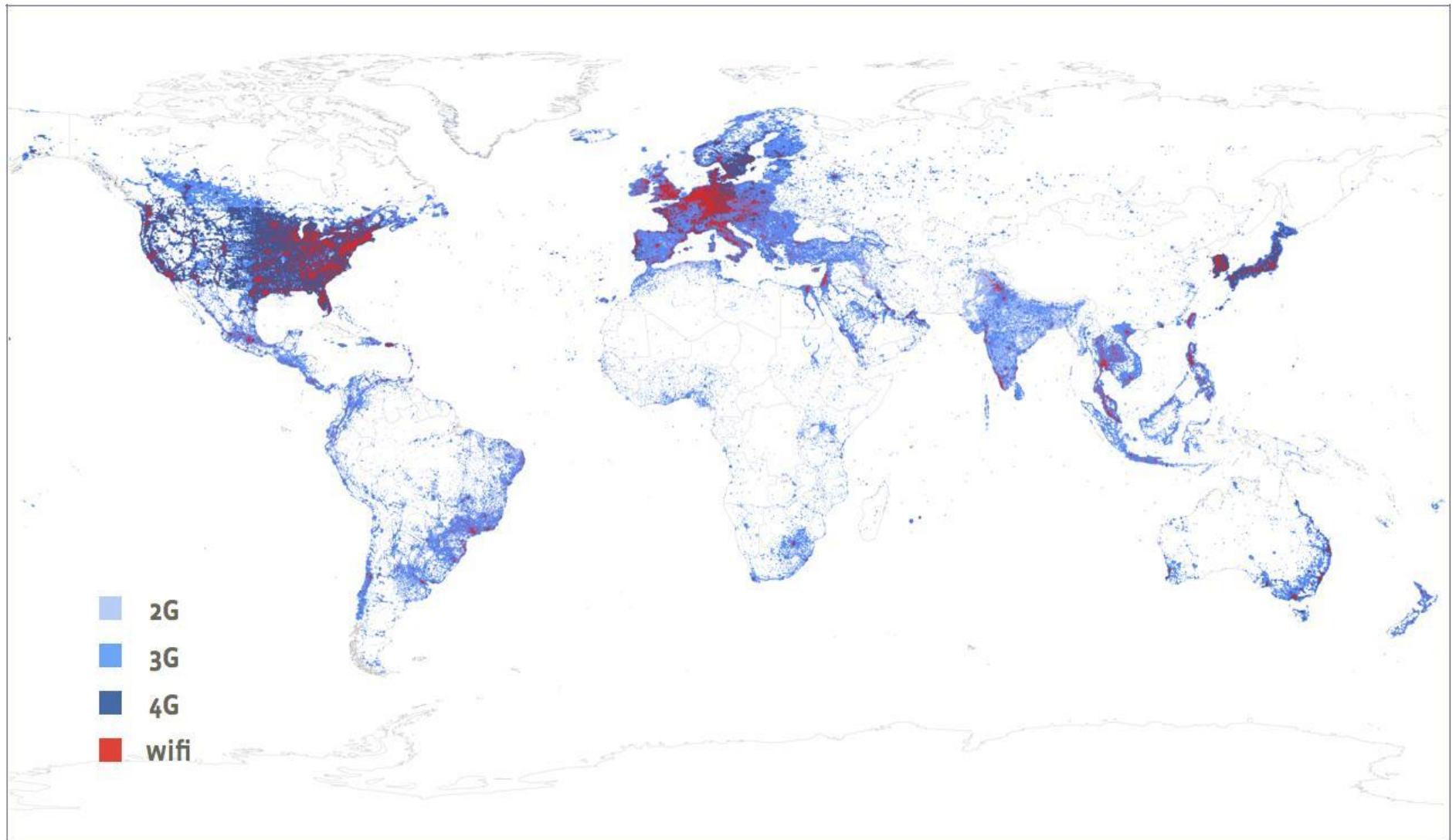
Technological development of rural and maritime areas and their integration into Digital Economy using 8 steps and 8 nationwide networks:

- 1. RuralNet (Telecom):** terrestrial mobile network with ubiquitous affordable mobile broadband access and digital mobile TV & Radio broadcasting with coverage on 100% rural areas, operating in HF & VHF spectrum (standard IEEE 802.22)
- 2. NavigationNet (GNSS):** terrestrial autonomous network with ubiquitous 1 centimeter level precision navigation with corrected signals of GPS, GALILEO, GLONASS, BEIDOU, providing 100% stable navigation services for transportation, agriculture, geodesy, etc.
- 3. AeroNet (Unmanned Aviation):** an infrastructure in the sky - overlay network of connected commercial Unmanned Aircraft Systems (UAS) providing nationwide services: telecommunications, digital 3D mapping of infrastructures (roads, buildings, etc.) and agricultural fields, video surveillance and monitoring, prompt delivery of e-commerce goods to rural areas, rescue operations.
- 4. AgriNet (Agriculture):** overlay network for connected farms (Internet of Things in agriculture) and ubiquitous digital services for farmers
- 5. AutoNet & MariNet (Transportation):** overlay network for connected cars, ships, Intelligent Transportation Systems, self-driving-cars & trucks, Unmanned Surface Vehicles (USV) and ubiquitous digital mobile services for drivers, sailors, passengers, transportation companies.
- 6. HealthNet (Medicine):** overlay network for connected healthcare wearables and ubiquitous mobile medical consultations of citizens online
- 7. EnergyNet (Energy):** overlay network for connected renewable energy sources, Smart Grids and electrification of rural areas.
- 8. SecurityNet:** overlay network for first responders and their devices, nationwide digital security services (instant warning of population in emergency situations, remote video monitoring of any areas from any distance, rescue operations, cybersecurity services for businesses)

Digital Divide

Only 10 % of Earth's land area are covered with mobile internet. More than 4 billion of people, living in rural areas, do not have an access to the internet and ICT

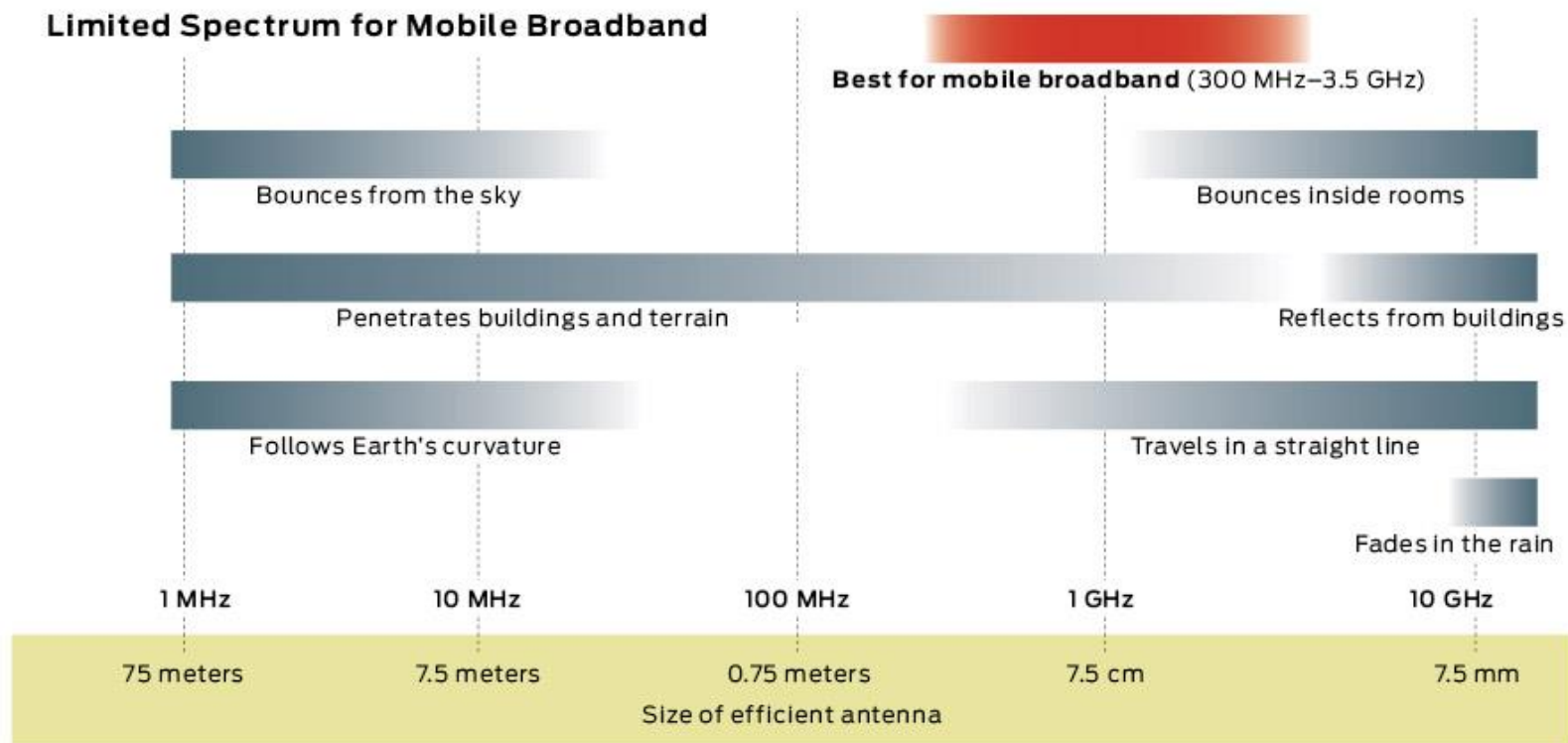
Mobile internet coverage map:



Limited spectrum & small coverage with traditional technologies

Due to the size of efficient antenna only UHF spectrum (frequencies 300 - 3000 MHz) are available for mobile broadband. The higher the frequency - the shorter a wavelength and smaller radius of coverage

- Spectrum refers to electromagnetic spectrum – the resource that allows us to send wireless signals. Almost every electronic device we use today, from smartphones to FM radio to TV remotes, uses spectrum frequencies to transmit wireless signals and information. Without spectrum, wireless communication would be impossible.
- Spectrum is a scarce resource you use every day, including when you use a mobile phone or Wi-Fi, listen to the radio, or click a remote control. As demand for spectrum increases, the supply becomes scarce.
- Due to the limitations of antenna technologies, which have not changed significantly during decades, only small portion of spectrum (UHF spectrum) is best suitable for mobile broadband because of the size of efficient antenna.



OPPORTUNITY WINDOW: The best frequencies for mobile broadband are high enough that the antenna can be made conveniently compact, yet not so high that signals will fail to penetrate buildings. This leaves a relatively narrow range of frequencies available for use [red band].

With traditional technologies it is unprofitable to cover rural areas

All mobile networks on the market operate in UHF frequencies having a very small radius of coverage. It is unprofitable to build networks in rural areas with low population density.

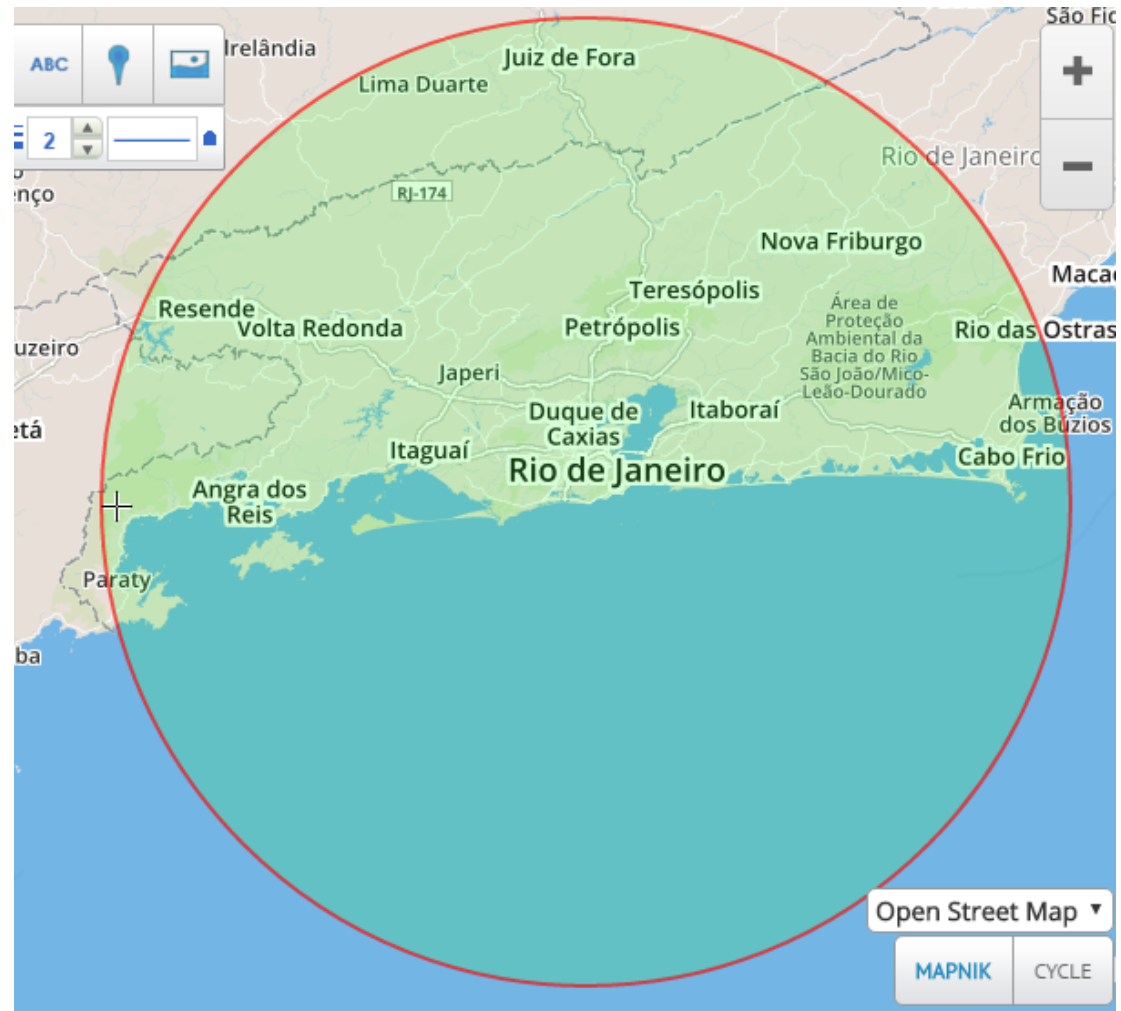
- All mobile networks on the market (3G, 4G, LTE, Wi-Fi) operate in UHF spectrum (frequencies above 300 MHz).
- Usually the radius of coverage of UHF base stations is about **3 - 10 kilometers**.
- As an example, a circle with 3 km radius on the south of Rio de Janeiro.
- Moreover, connection are unstable in bad weather (storm), rough landscape (mountains, big buildings, etc.), metro, etc.



With new technologies – hundreds of times cheaper & more effective

Next generation antenna technologies (patent US 8823599) allow creating mobile mesh-networks on HF & VHF frequencies with long range up to 150 km communications

- Next generation antenna systems, which are 10 times smaller than classical ones on the market, allow adding HF & VHF spectrum for mobile broadband (3 - 300 MHz) in order to bring long range communications up to **150 kilometers** from base station
- Area of coverage is up to 70 650 square kilometers
- Speed up to 31 Mbps
- With next generation antenna systems connections are 100% stable in any weather (even in storm) and any rough landscape (even in high mountains, canyons, etc), also their energy consumption is to 40% lower and it decreases operational expenses on network maintenance



Integration of rural & maritime areas into Digital Economy

The availability of all digital mobile services in absolutely in any geographic location

- In fact, even 500 HF & VHF transceivers can cover the whole area of Latin America & Caribbean
- The project proposes replacement of antenna systems of transceivers on the market, organization of local assembling of transceivers in one of the countries of region and construction of ubiquitous mesh-network where all of the objects in the network (smartphones, tablets, cars, trucks, ships, drones, etc.) are interconnected via highly secure long-range links
- It is planned **to manufacture and locate in the countries of Latin America and Caribbean approximately 93 764 transceivers in until 2020** to create mobile networks on the ground, on the water surface and in the air for successful integration of rural and maritime areas into Digital Economy.



Nationwide mobile mesh-networks of Latin America & Caribbean: on the ground, on the water surface and in the air

1. Ubiquitous mobile infrastructure on the ground:

On the initial stage approximately 46 880 transceivers located on towers, roofs, trucks, buses, trains, etc.



2. Ubiquitous mobile infrastructure on the water surface:

On the initial stage approximately 15 629 transceivers located on ships, Unmanned Surface Vehicles, islands, buoys.



3. Ubiquitous mobile infrastructure in the sky:

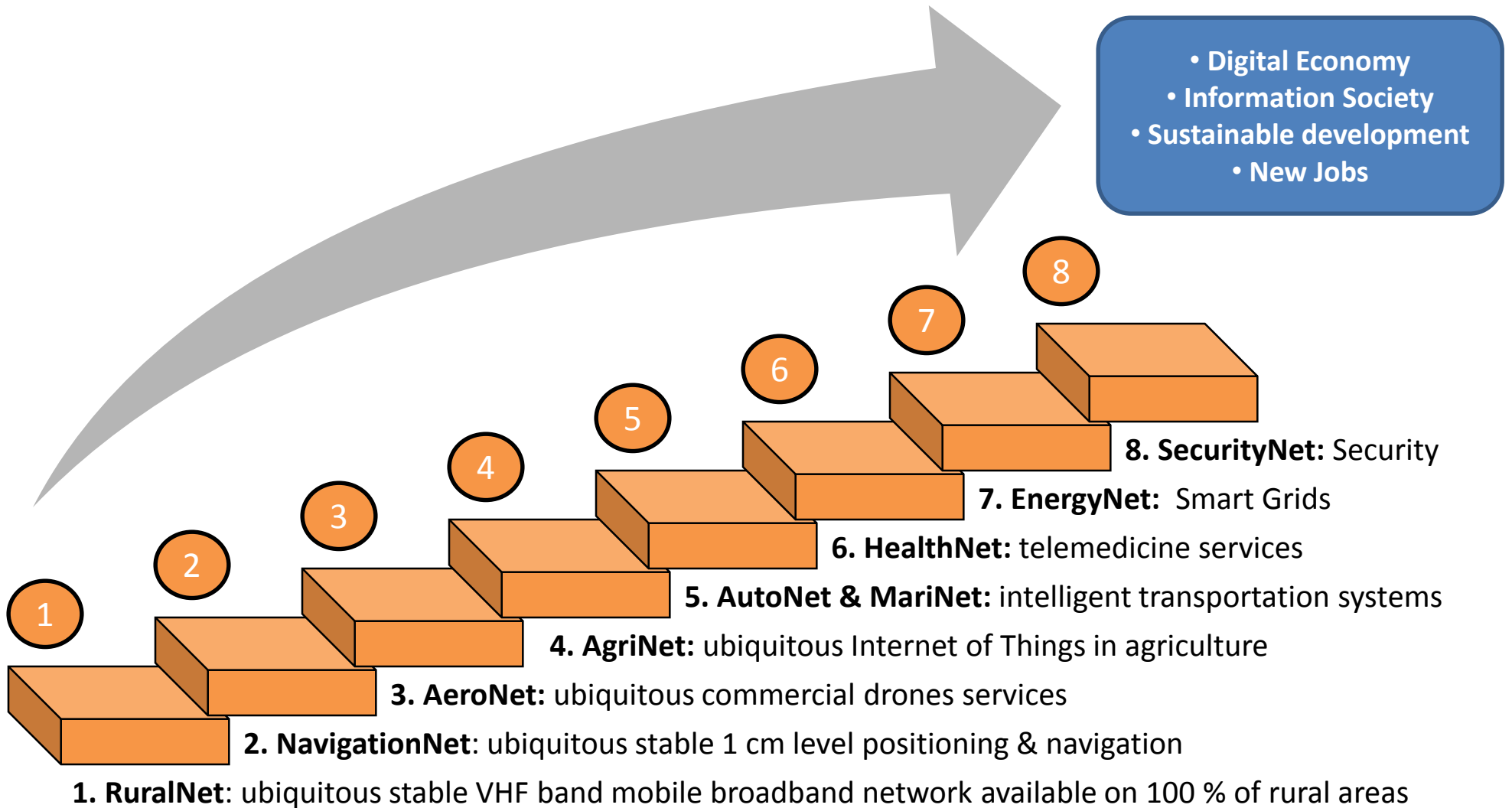
On the initial stage approximately 31 255 commercial Unmanned Aircraft Systems (“flying base stations”)



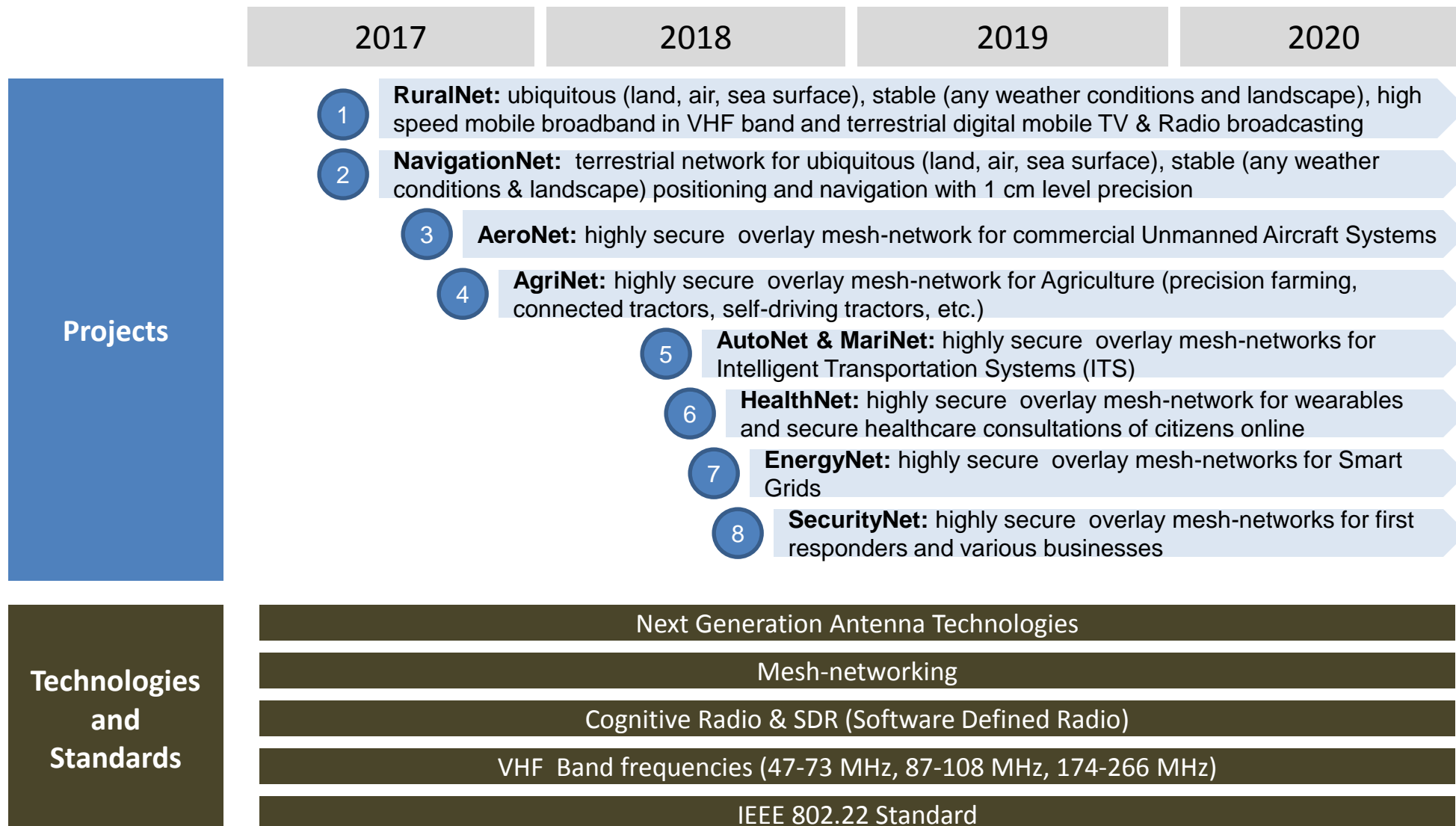
Target markets

Market Group	Global Market	Global Market Size by 2020	CAGR (Compound Annual Growth Rate)	Target market share in countries of Latin America & Caribbean by 2020
Telecom	Telecom market	\$1414 bn	1.27 %	5 %
GNSS	Global Navigation Satellite Systems market (GNSS)	\$483 bn	9 %	5 %
Aviation	Commercial Avionics Systems market	\$23.7 bn	6.6 %	5 %
	Commercial Applications of Drones market	\$127 bn		5 %
Agriculture	Precision Farming market	\$4.55 bn	12.2 %	5 %
	Agricultural equipment market	\$281.61 bn	8.7 %	0.5 %
Transportation	Connected Car market	\$123.08 bn	34.21 %	5 %
	Intelligent Transportation Systems	\$33.89 bn	11.57%	5 %
	Self-Driving Cars market	\$42 bn (by2025)	—	0.5 %
Maritime transportation	Maritime mobile communications market	\$5.62 bn	10.2 %	5 %
	Maritime e-Navigation market	\$1.2 bn	6.9 %	5 %
	Maritime security market	\$22.26 bn	7.7 %	5 %
	Unmanned Surface Vehicles market	\$0.85 bn	18 %	5 %
Medicine	Telemedicine market	\$36.3 bn	14.3 %	5 %
	Healthcare wearable's(eHealth) market	\$12.9 bn	20.15 %	5 %
Energy	Smart Grid market	\$139.59 bn	18.20 %	5 %
Security	Cybersecurity market	\$170.21 bn	9.8 %	5 %
	Video surveillance systems market	\$42.06 bn	23.51 %	5 %

8 steps – 8 industries – 8 nationwide networks



Key networks, technologies and standards



Step 1. RuralNet (Telecom)

Objective: ubiquitous (land, air, sea surface), stable (any weather conditions and landscape), high speed mobile broadband and digital media services (mobile digital TV & Radio broadcasting) in VHF band

	3 rd Q 2017	2018	2019	2020
Key results	MobileNet: terrestrial VHF band mobile ICT-infrastructure (standard IEEE 802.22) with 100% coverage and extension of services of local (foreign) mobile network operators (MNOs) to all rural , mountain and sea areas			
	VHF Band Spectrum optimization: additional terrestrial infrastructure for digital mobile TV& Radio broadcasting, complete elimination of multi-million dollar expenses on old analog TV & Radio broadcasting , the transition of analog TV and Radio into digital mobile format, making VHF bands free of analog signals (the fulfillment of international obligations: all analog TV signals in all countries had to be switched off already on 17 th of June 2015)			
	100 % stable communications in all weather and landscape conditions: storm, large buildings, metro, etc. because of new antenna technologies and VHF bands used			
	100% affordable (starting with \$0.50 monthly data plans) mobile broadband services for rural areas with speed 23 Mbps			
	Long range (up to 150 km) Device-to-Device, Vehicle-to-Vehicle, Vehicle-to-Device communications : all devices and objects in network work like virtual base stations and can transmit data on long distance			
New jobs created	« Any service- Any device –Anywhere » principle: all kind of digital services available on any devices in any geographical place			
	Electronics assemblers: assembling of transceivers for networks, construction of networks in various countries of Mediterranean and Eastern Europe			
	Operators of telecom systems: networks maintenance			
	Cybersecurity specialists: prevention of cyber attacks on the networks			
Partners & form of cooperation	Local (foreign) Mobile Networks Operators: extension of their services into all rural and maritime areas, improving their services (stable connections in all conditions, cybersecurity, etc.), increasing telecom market size			
	Local (foreign) TV & Radio broadcasters: service fee for digital mobile TV & Radio broadcasting, extension of their services to all rural and maritime areas, increasing TV and Radio Advertising market size			

Step 1. RuralNet

Action Lines

Market results by 2020

- 5 % of telecom market
- 5% of TV advertising market
- 5 % of Radio advertising market

Total cost for Dominican Republic & Caribbean Sea

\$ 72.88 M

Action Lines

Responsible

Start

End

Cost

1. Creation of a joint venture, obtaining VHF band frequency licenses and rights to use TV towers	—	3 rd Q. 2016	4 th Q. 2016	—
2.				
• Replacement of classical antenna systems of 802.22 transceivers on the market to next generation antenna systems	Genesys Technologies	3 rd Q. 2016	3 rd Q. 2017	\$ 20 940 388,88
• Detailed technical documentation of transceivers for local assembling				
• Certification				
3. Replacement of classical antenna systems of VHF TV & Radio broadcasting transceivers on the market to next generation antenna systems, detailed technical documentation, certification	Genesys Technologies	3 rd Q. 2016	3 rd Q. 2017	\$ 18 221 931,22
4. Hiring and training of local engineers	Genesys Technologies	1 st Q. 2017	3 rd Q. 2017	\$ 300 000
5. Construction of pilot networks in Dominican Republic, demonstration for foreign partners in countries of Latin America and Caribbean, signing export contracts	Joint venture	3 rd Q. 2017	4 th Q. 2017	\$ 1 000 000 (including demonstration of networks NavigationNet, AeroNet & AgriNet)
6. Construction of mobile ICT-infrastructure on the ground (all land area of Dominican Republic): 500 transceivers	Joint venture	3 rd Q. 2017	4 th Q. 2018	\$ 5 000 000,00
7. Construction of mobile ICT-infrastructure on the water surface (all area of Caribbean Sea): 3000 transceivers	Joint venture	3 rd Q. 2017	4 th Q. 2018	\$ 30 000 000,00

Step 1: RuralNet

Products & services created

**Ubiquitous highly secure mobile ICT-infrastructure
with nationwide coverage (100% land & sea areas) in
all countries of Latin America and Caribbean**

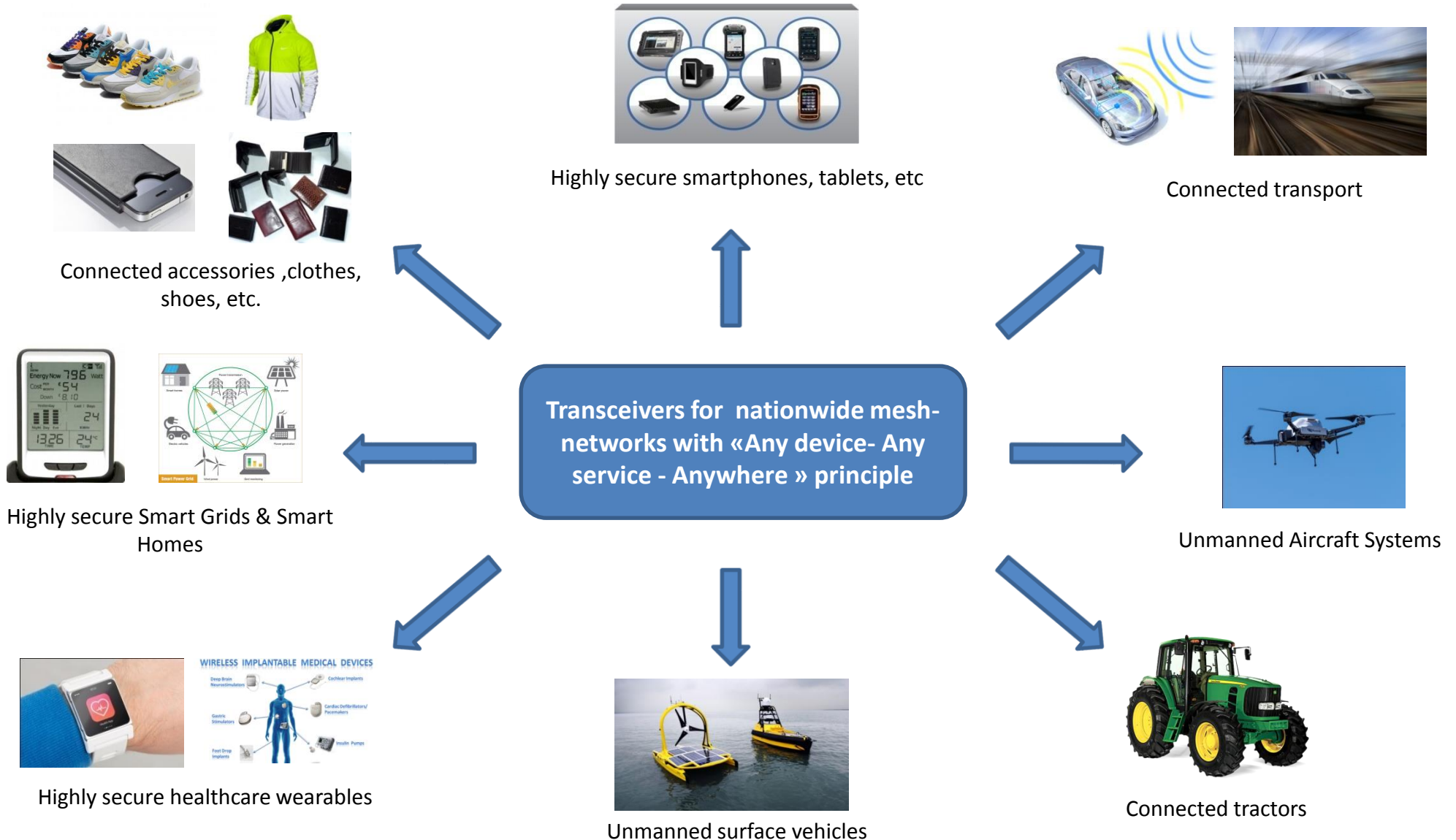


Key advantages:

- **At least 227 times cheaper** in comparison with existing technologies on the commercial market because of VHF bands and new antenna technologies
- **Mesh-network:** all objects in the network are interconnected on a **distance up to 150 km** between each other and can work like virtual base stations to transmit other objects' data on absolutely any distance
- **100% stable communications:** antenna systems are wide band tunable regardless of position
- **Increased cybersecurity:** additional encryption on hardware (antenna systems) level

Step 1: RuralNet

Products & services created



Step 2. NavigationNet (GNSS)

Objective: ubiquitous (land, air, sea surface), stable (any weather conditions & landscape) positioning and navigation with 1 cm level precision and immunity to spoofing

3rd Q 2017

2018

2019

2020

Key results

100% coverage: terrestrial network LOCATANET operating in VHF band with next generation of antenna systems technologies

100 % stable positioning and navigation in any conditions: storm, large building, metro, etc.

Correction of GPS, GLONASS, BEIDOU, GALILEO signals

Immunity to spoofing: it will be almost impossible to spoof commercial drones, self-driving cars, autonomous tractors, etc.

Next Generation GNSS receivers with extremely high signal selectivity, combining GPS, GLONASS, BEIDOU, GALILEO + LOCATA

New Jobs created

Electronics assemblers: assembling of transceivers for networks, construction of networks in various countries

Operators of navigation systems: network maintenance

Cybersecurity specialists: prevention of cyber attacks on the networks

Partners & form of cooperation

LOCATA (Australia): improvement of their solution using new antenna technologies, transition to VHF band frequencies, combining communications data and navigation data in one smart network (standard IEEE 802.22)

Step 2. NavigationNet

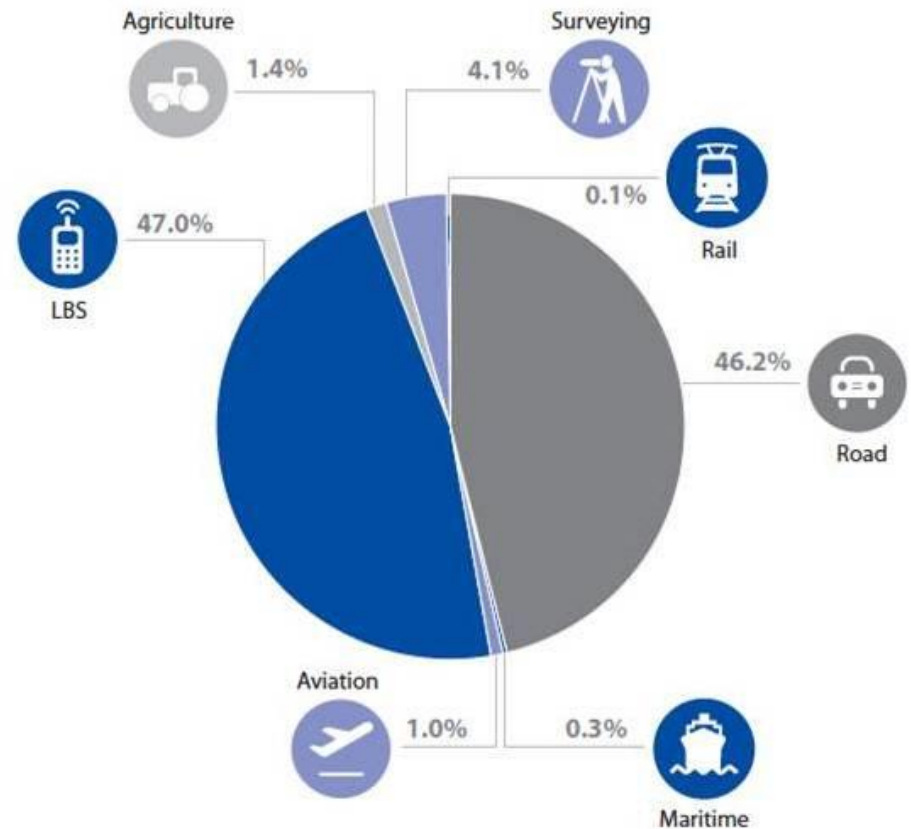
Action Lines

Market results by 2020	Action Lines	Responsible	Start	End	Cost
<ul style="list-style-type: none">5% of GNSS receivers market	1.				
	<ul style="list-style-type: none">Replacement of antenna systems of GNSS receivers on market (GPS, GLONASS, BEIDOU, GALILEO, LOCATA), transition of LOCATANET to VHF frequencies(174-266 MHz):	Genesys Technologies	3 rd Q. 2016	3 rd Q. 2017	\$ 18 221 931,21
	<ul style="list-style-type: none">Detailed technical documentation for local assembling, certification				
	2. Construction of pilot networks in Dominican Republic, demonstration for foreign partners	Joint Venture	3 rd Q 2017	4 th Q 2017	\$ 1 000 000 (this action line goes together with step 1: RuralNet)
Total cost for Dominican Republic					
\$18.29 M					

Step 2: NavigationNet

Products and services created

- **GNSS receivers with next generation antenna systems**, combining GPS, GLONASS, BEIDOU, GALILEO и LOCATA for agriculture, surveying, rail , road and maritime transport, aviation and various devices
- **Service fee for ubiquitous 1 cm level positioning and navigation**, stable in all weather conditions and landscape



Step 3. AeroNet (Network for Commercial Drones)

Objective: Safe integration of commercial Unmanned Aircraft Systems (UAS) in airspace and nationwide commercial drones services (agriculture, delivery, rescue operations, etc.)

4th Q 2017

2018

2019

2020

Key results

AeroNet: highly secure overlay mesh-network for commercial UAS

100% coverage: stable terrestrial control non-line of sight and data collection in real time on the whole countries territory

100 % stable data-communications between objects moving in airspace (Intelligent Air Transportation System)

Immunity to spoofing: it will be almost impossible to spoof commercial drones

Next Generation Avionics with new antenna technologies, with extremely high signal selectivity, with lower weight, and no loss of aerodynamic properties (antennas can be made of any shape, and can covered like a thin foil layer)

New Jobs created

Electronics assemblers: assembling of avionics

Operators of UAS: controlling the group of unmanned aircraft systems and data collection

Operators of Intelligent Aerial Transportation Systems: control and regulation of commercial air traffic

Cybersecurity specialists: prevention of cyber attacks on the systems

Partners & form of cooperation

Commercial drones manufacturers, delivery companies : supply of avionics for drones

Step 3. AeroNet

Action Lines

Marker results by 2020

- 5 % of commercial avionics market
- 5 % of commercial drones market

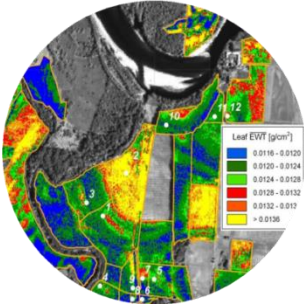
Total cost for Dominican Republic

\$18.29M

Action Lines	Responsible	Start	End	Cost
1. Replacement of antenna systems of VHF avionics on the market, technical documentation for local assembling, certification	Genesys Technologies	3 rd Q 2016	3 rd Q 2017	\$ 18 221 931,21
2. Construction of pilot network, demonstration for foreign partners, signing of export contracts	Joint venture	3 rd Q . 2017	4 th Q 2017	\$ 1 000 000 (together with RuralNet and NavigationNet)
3. AeroNet – nationwide network of commercial drones in Dominican Republic: on the initial stage 100 commercial Unmanned Aircraft Systems	Joint venture	3-й кв. 2017	4-й кв. 2018	\$ 10 000 000
Combing networks on the ground, on the water surface and in the air in one single smart mesh-network				

Step 3: AeroNet

Products and services created



Remote sensing



Detailed Cadastral plans
of any territories



Monitoring of various
infrastructures



GIS services for agriculture



Integration of UAS into rescue
operations



Consumer goods delivery

Step 4. AgriNet (Network for Agriculture)

Objective: making rural areas and agriculture attractive for young people, foreign investors using Internet of Things in agriculture and commercial drones

	4 th Q 2017	2018	2019	2020
Key results	AgriNet: highly secure overlay mesh-networks for Internet of Things in agriculture			
	100% transparency of agribusiness (all processes and results) for farmers, investors, banks, insurance companies			
	100 % attractiveness of agriculture for young people (including people with disabilities) because of ability to remotely operate autonomous agriculture machinery, drones, etc.			
	Reducing expenses on fuel, fertilizers, pests up to 30%; increasing crop yield, profit up to 20%			
	Transceivers for connected tractors: stable telematics, data-communications, 1 cm level positioning and navigation, ability of remote control on any distance.			
New Jobs created	Electronics assemblers: assembling of transceivers for connected tractors and other agricultural machinery			
	Operators of commercial drones, connected tractors: remote control of group of drones, tractors; data collection, 3D mapping of agricultural fields			
	IT-farmers: analysis of agricultural data			
	Agriconsultants: online consultation of local farmers			
	Cybersecurity specialists: prevention of cyber attacks on networks			
Partners & form of cooperation	Agricultural machinery manufacturers: supply of highly secure transceivers for agricultural machinery for stable telematics, control, navigation, etc.			
	Trimble (US): improvement of their «Connected Farm» system (as it's the best on commercial market so far) and adoption to the networks in different countries			

Step 4. AgriNet

Action Lines

Market results by 2020

- 5 % of Precision Farming market
- 0.5 % of Agricultural machinery market

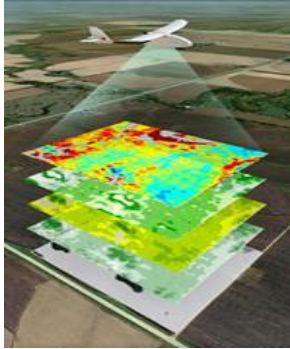
Total cost for Dominican Republic

\$ 25.7 M

Action lines	Responsible	Start	End	Cost
2. Creation of «Connected Farm» applications with interfaces on local Latin America & Caribbean languages	Trimble, Genesys Technologies	3 rd Q 2016	4 th Q 2017	\$ 1 000 000
3. Creation of highly secure overlay network of Internet of Things in Agriculture	Joint venture	3 rd Q 2017	4 th Q 2017	\$ 2 500 000
4. Creation of detailed 3D maps of all land areas of Dominican Republic	Joint venture	1 st Q 2018	4 th Q 2018	\$ 1 000 000
5. Hiring and training of local specialists: commercial drones operators, IT-farmers, etc	Joint venture	3 rd Q 2017	4 th Q 2020	\$ 300 000
6. Organization of local assembling of self-driving tractors	Genesys Technologies, Kinze Manufacturing	1 st Q 2018	4 th Q 2020	\$ 20 900 000

Step 4: AgriNet

Products and services created



3D mapping and analysis of agricultural fields



Detailed meteo data & rainwave contour maps



Autopilot and parallel steering



Special tablets for farmers



Unmanned systems for irrigation and pest management



Storing agridata in the cloud + access to historical data



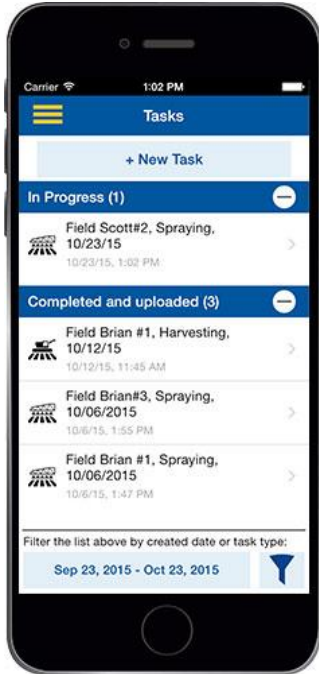
Online financial tools for farmers, insurance, etc.



Integration of autonomous machinery into agriculture and Remote precision farming

Step 4: AgriNet

Products and services created



Connected Farm Field App

This app helps farmers to understand which field areas are profitable and why.



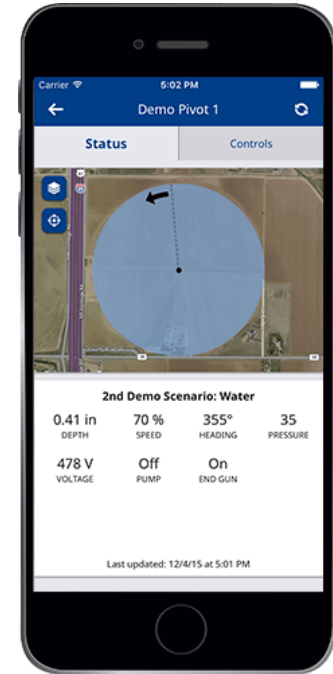
Connected Farm Scout App

- detailed field maps
- crop health imagery
- nitrogen rates
- analysis of problems



Connected Farm Fleet App

- control of farm fleet
- control of work
- historical positions and data



Connected Farm Irrigate App

- Monitor and control irrigation systems in real-time from any location with a smartphone or tablet.
- The Irrigate app helps farmers ensure the right amount of fluid is applied in the right place.

Step 5. AutoNet & MariNet (Networks for Transportation)

Objective: smart transportation and logistics, precision navigation and safe integration of self-driving cars, unmanned surface systems into road and maritime traffic

2nd Q 2018

2019

2020

Key results

AutoNet & MariNet: highly secure overlay mesh-networks for road, rail & maritime transport (Intelligent Transportation Systems)

100% stable data- communications and navigation on land, on water in any weather conditions and any landscape

100 % remote control and smart logistics in any geographical place

Reducing transportation accidents, 100 % control on accidents, **100 % control** on maritime security (illegal fishing, illegal migration routes, piracy)

Transceivers for road, rail & maritime transport: stable and highly secure data-communications and telematics, 1 cm level positioning and navigation, possibility of remote terrestrial control of unmanned surface systems on any distance

New Jobs created

Electronics assemblers: assembling of transceivers

Operators of Intelligent Transportation Systems: controlling and regulating of traffic on land and sea

Operators of Unmanned Surface Vehicles: operating the group of Unmanned Surface vehicles and Unmanned Aircraft Systems for effective maritime control, maritime security and data collection in real time

Cybersecurity specialists: prevention of cyber attacks on networks

Partners & form of cooperation

System integrators, Manufacturers of self-driving cars, Unmanned Surface Vehicles: supply of transceivers

Step 5. AutoNet & MariNet

Action Lines

Market results by 2020		Action Lines	Responsible	Start	End	Cost
<ul style="list-style-type: none">5 % of connected car market5 % of Intelligent transportation systems market0.5 % of self-driving cars market5 % of maritime communications market5 % of maritime e-navigation market5% of maritime security market5% of Unmanned Surface Vehicles market		1.1 Replacement of antenna systems of Intelligent Transportation systems on the market, technical documentation, certification	Genesys Technologies	3 rd Q. 2017	4 th Q. 2018	\$ 20 900 000
		1.2 Organization of local assembling of highly secure modules for cars, trucks, unmanned surface vehicles, etc				
		2. Creation of highly secure overlay networks for stable data-communications between cars, unmanned surface vehicles, etc.	Joint venture	2 nd Q 2018	4 th Q 2018	\$ 5 000 000
		3. Safe integration of self-driving cars into local road traffic	Joint venture	3 rd Q. 2017	4 th Q. 2020	—
		4. Hiring and training of local specialists: operators of intelligent transportation systems, maritime security systems, unmanned surface vehicles, etc	Joint venture	3 rd Q 2017	4 th Q . 2020	—
Total cost for Dominican Republic						
\$ 25.9 M						

Step 5: AutoNet & MariNet

Products and services created



Infotainment: stable mobile internet and digital media services



Safety & drive assistance



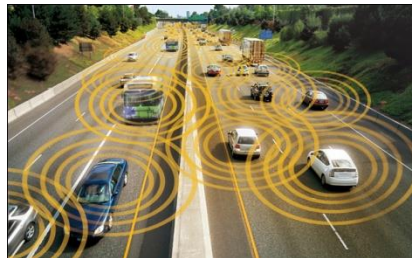
Stable navigation services



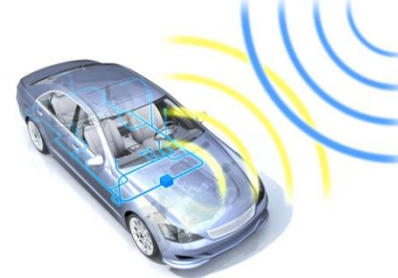
location based advertising



eCall systems



Stable and highly secure data communications between moving objects



Stable telematics & remote diagnostics



Insurance «pay as you drive» (how you drive)

Step 5: AutoNet & MariNet

Products and services created



Stable mobile internet, communications & navigation even in storm weather



Commercial services using Unmanned Surface Vehicles



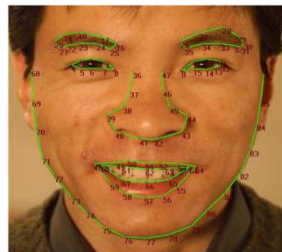
Mesh-networks of unmanned ground, surface and maritime systems operating as one system



Stable remote control of unmanned systems from any distance and real time data collection



Effective control on maritime security: illegal fishing, migration routes, piracy and maritime terrorism



Ability to identify, track criminals remotely on any distance, create a digital «Face ID», storing in secure database for historical data



100% stable cargo tracking in any areas and smart logistics



Cybersecurity: highly secure communications on land, in air and on water surface

Step 6. HealthNet (Network for Telemedicine)

Objective: Remote healthcare consultations of rural citizens, remote monitoring through highly secure wearables

2nd Q 2018

2019

2020

Key results

HealthNet: highly secure overlay mesh-network for Telemedicine and wearables

Highly secure communications and 100% stable working of wearables in any conditions and geographical place

Ability to connect medical history to eID for immediate help in critical situations

Highly secure modules for healthcare wearables and other medical equipment

New Jobs created

Electronics assemblers: assembling highly secure modules for healthcare wearables

IT-doctors: analysis of data coming from wearables

Online doctors: remote consultations of citizens

Consultants on healthy aging: preparation of individual programs for seniors

Cybersecurity specialists: prevention of cyber attacks on networks

Partners & form of cooperation

Healthcare wearables manufacturers: supply of highly secure modules and transceivers

Telemedicine companies: service fee for using networks

Step 6. HealthNet

Action Lines

Market results by 2020	Action Lines	Responsible	Start	End	Cost
<ul style="list-style-type: none">• 5 % of telemedicine market• 5% of healthcare wearables market	1 Replacement of antenna systems of healthcare wearables, transition to VHF bands, technical documentation for local assembling	Genesys Technologies	3 rd Q. 2017	4 th Q. 2018	\$ 20 900 000
	2. Creation of highly secure overlay network for telemedicine and healthcare wearables	Joint venture	2 nd Q. 2018	4 th Q. 2018	\$ 2 500 000
	3. Hiring and training of local specialists	Joint venture	3 rd Q. 2017	4 th Q. 2020	—
Total cost for Dominican Republic					
\$ 23.4 M					

Step 6: HealthNet

Products and services created



Highly secure and stable remote consultations



Highly secure and stable remote monitoring in any geographical place

WIRELESS IMPLANTABLE MEDICAL DEVICES



Highly secure wearables with encryption on both software and hardware level

Step 7. EnergyNet (Network for Smart Grids)

Objective: highly secure Smart Grids, remote control of energy networks in rural areas

3rd Q 2018

2019

2020

Key results

EnergyNet: highly secure overlay mesh-networks for Smart Grid

100% smart control and transition to smartmeters

Electrification of rural areas удаленных сельских территорий с помощью возобновляемых источников энергии

Local manufacturing of highly secure modules for Smart Grids

Создаваемые новые рабочие места и профессии

Electronics assemblers: assembling highly secure modules for healthcare wearables

Smart Grid operators: maintenance of networks

Cybersecurity specialists: prevention of cyber attacks on networks

Partners & form of cooperation

Smart Grid equipment manufacturers: supply of highly secure modules, construction of smart grids in various countries

Energy companies: service fee for using highly secure networks

Sun Edison (US): electrification of rural areas

Step 7. EnergyNet

Action Lines

Market results by 2020

- 5 % of Smart Grid market

Total cost for Dominican
Republic

\$ 23.4 M

Action Lines

Responsible

Start

End

Cost

1 Replacement of antenna systems of smart grid modules on the market, transition to VHF frequencies, technical documentation for local assembling	Genesys Technologies	3 rd Q. 2017	4 th Q. 2018	\$ 20 900 000
2. Creation of highly secure overlay network for SmartGrid	Joint venture	2 nd Q. 2018	4 th Q. 2018	\$ 2 500 000
3. Hiring and training of local specialists	Joint venture	3 rd Q. 2017	4 th Q. 2020	—

Step 7: EnergyNet

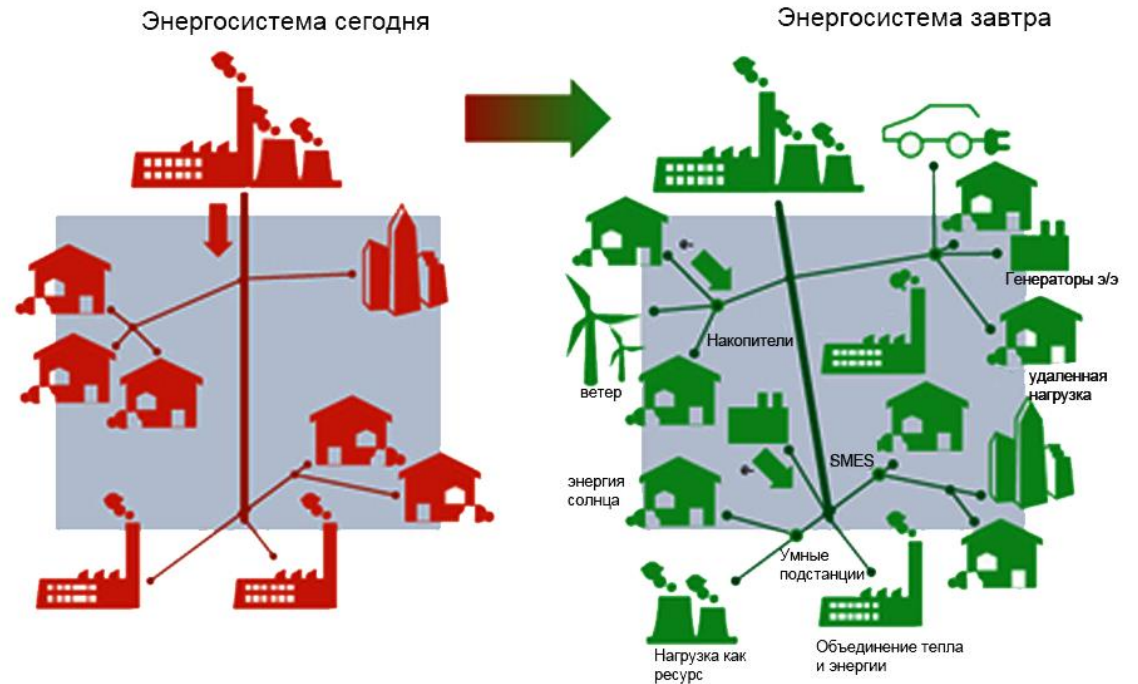
Products and services created



Full digital control through highly secure smartmeters and prevention of theft of electricity, gas, water, etc.



Electrification of rural areas



Transition to distributed networks and smart energy systems

Step 8. SecurityNet (Networks for First Responders & Businesses)

Objective: Creation of nationwide interoperable mesh-networks for first responders (ambulance, police, fire services) for stable operations during emergency situations

3rd Q 2018

2019

2020

Key results

FirstNet: creation of highly secure overlay network for first responders

100% stable communications and video surveillance in real time during emergency situations

100% effective instrument for controlling any remote areas in real time , identification of criminals, creation of Face ID's, storing in local database

Instant warning of population during emergency situations

Highly secure modules and transceivers for video surveillance systems with ability to monitor any remote areas, maritime areas, mountain areas in real time on any distance , with facial recognition technologies

Highly secure networks for local businesses.

New Jobs created

Electronics assemblers: assembling highly secure modules for video surveillance systems, smartphones, tablets for first responders and businesses

Security systems operators: maintenance of security systems

Cyber Investigators: investigation of cybercrime

Partners & form of cooperation

Manufacturers of video surveillance systems, secure smartphones, tablets, other devices: supply of highly secure modules

Step 8. SecurityNet

Action Lines

Market results by 2020

- 5% of cybersecurity market
- 5% of video surveillance systems market

Total cost for Dominican Republic

\$ 23.4 M

Action Lines	Responsible	Start	End	Cost
1 Organization of local assembling of highly secure VHF modules for video surveillance systems, special devices, etc.	Genesys Technologies	3 rd Q. 2017	4 th Q. 2018	\$ 20 900 000
2. Creation of highly secure overlay network for first responders	Joint venture	2 nd Q. 2018	4 th Q. 2018	\$ 2 500 000
3. Hiring and training of local specialists	Joint venture	3 rd Q. 2017	4 th Q. 2020	—

Step 8: SecurityNet

Products and services created



Highly secure modules and devices for first responders



Special “internet clothes” operating on HF & VHF frequencies for first responders for 100 % stable communications in any conditions, any distance.



Special drones and devices for police



Drones for firefighting, delivery of medicaments, rescue operations



Highly secure overlay networks and devices for businesses

4 groups of export products

4 groups of products will be assembled in Dominican Republic and exported to other countries of Latin America and Caribbean

1. VHF Transceivers: (base station transceivers)

- Stationary (for TV towers, roofs, etc)
- Mobile (trucks, ships, etc.)
- Direct cost: \$ 10 000
- Export price: \$ 30 000

2. Avionics Transceivers: («flying» base stations)

- For creation of ubiquitous networks on the ground and in the air
- Direct cost:: \$ 30 000
- Export price: \$ 50 000

3. GNSS-receivers : 1 cm level precision GNSS receivers

- GPS + GLONASS + BEIDOU + GALILEO +LOCATA
- Direct cost: \$ 80 – 5000
- Export price: \$ 100 - 15 000

4. Transceiver Lite: transceivers for markets of Internet of Things

- Transceivers for tractors, energy systems, wearables, etc.
- Direct cost: stating from \$ 32
- Export price: stating from \$ 35

All transceivers consist of 2 main parts



1. Modules of next gen antenna systems: will be manufactured in Dominican republic



2. Various digital modules (Intel, Qualcomm, etc): will be imported

Budget

Project stages	Duration	Start date	Finish date	Cost
Step 1. RuralNet - VHF mobile internet transceivers (IEEE 802.22 standard): replacement of antenna systems of 802.22 transceivers on the market, detailed technical documentation for local assembling, certification	365	01.09.2016	01.09.2017	\$ 20 940 388.88
Step 1. RuralNet - VHF digital TV & Radio transceivers: replacement of antenna systems of 802.22 transceivers on the market, detailed technical documentation for local assembling, certification	365	01.09.2016	01.09.2017	\$ 18 221 931.22
Step 2. NavigationNet - GNSS (Navigation): replacement of antenna systems of GPS, GLONASS, BEIDOU, GALIELO, BEIDOU, LOCATA transmitters on the market, detailed technical documentation for local assembling, certification	365	01.09.2016	01.09.2017	\$ 18 221 931.21
Step 3. AeroNet - VHF Avionics: replacement of antenna systems of VHF avionics on the market, detailed technical documentation for local assembling, certification	365	01.09.2016	01.09.2017	\$ 18 221 931.22
Step 4. AgriNet: creation of «Connected Farm» applications with interfaces on local Latin America & Caribbean languages	365	01.09.2016	01.09.2017	\$ 1 000 000.00
Training of local engineers	365	01.09.2016	01.09.2017	\$ 300 000.00
Construction of pilot networks (RuralNet, NavigationNet, AeroNet, AgriNet), demonstration to foreign partners	122	01.09.2017	31.12.2017	\$ 1 000 000.00
Construction of mobile ICT-infrastructure on the ground (all land area of Dominican Republic): 500 transceivers	122	01.09.2017	31.12.2017	\$ 5 000 000.00
Construction of mobile ICT-infrastructure on the water surface (all area of Caribbean Sea): 3000 transceivers located on ships	122	01.09.2017	31.12.2017	\$ 30 000 000.00
Construction of infrastructure in the sky - nationwide network of commercial drones in Dominican Republic: on the initial stage 100 commercial Unmanned Aircraft Systems	122	01.09.2017	31.12.2017	\$ 10 000 000.00
Total				\$ 122 906 182.53

Target markets in Dominican Republic

Services	Global market	Global market size by 2020*	Market size in Dominican Republic by 2020**	Target market share in Dominican Republic by 2020
Telecom: mobile broadband service in rural areas, service fee from local mobile networks operators for usage of our network	Telecom market (mobile network operators)	\$1414 B	\$ 1300.88 M	5 % (\$ 65.04 M)
Digital Media: service fee from local(foreign) TV broadcasters for usage of our network	TV advertising market	\$ 210.92 B	\$ 194.04 M	5 % (\$ 9.70M)
Digital Media: service fee from local(foreign) digital Radio broadcasters for usage of our network	Radio advertising market	\$ 32 B	\$ 29.44 M	5 % (\$1.47 M)
AeroNet: commercial drones services (infrastructure surveying,)	Commercial drones market	\$ 127 B	\$ 116.84 M	5 % (\$ 5.84 M)
AgriNet: precision farming and connected agriculture services for farmers	Precision farming market	\$ 4.55 B	\$ 4.18 M	5 % (\$ 0.20 M)
AutoNet: connected car services (connectivity, navigation, telematics, safety & driving assistance, etc.)	Connected Car market	\$ 123.08 B	\$ 113.23 M	5 % (\$ 5.61M)
MariNet: maritime mobile broadband and eNavigation services	Maritime communications market	\$ 5.62 B	\$ 5.17 M	5 % (\$ 65.04 M)
HealthNet: eHealth services and service fee from local telemedicine companies	Telemedicine market	\$ 36.3 B	\$ 33.39 M	5 % (\$ 1.66 M)
EnergyNet: smart grid services and service fee from local energy companies	Smart Grid market	\$ 139.59 B	\$128.42 M	5 % (\$ 6.42 M)
SecurityNet: security & video surveillance services	Video surveillance market	\$ 42.06 B	\$ 38.69 M	5 % (\$ 1.93 M)
SecurityNet: cybersecurity services	Cybersecurity market	\$ 170.21 B	\$ 156.59 M	5 % (\$ 7.82 M)

* - by data of Statista, Markets&Markets, Pwc ;

** - nominal GDP of Dominican Republic is approximately 0.092 % of world's GDP, market size in Dominican Republic is calculated as 0.092% of Global market size

SWOT analysis

Strengths

- **Cost of coverage:** at least 227 times cheaper in comparison with existing equipment on the market because of long-range communications on VHF frequencies : 47-73 MHz, 87-108 MHz, 174-266 MHz.
- **nobody on the market has antenna technologies to utilize VHF spectrum** and it's being unutilized in all the countries.
- **solving essential problems in wireless industry and drastically improving communications with next gen antenna systems:** making communications 100% stable in any conditions, increasing cybersecurity, decreasing operational expenses (energy consumption), making ubiquitous mobile broadband

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Weaknesses

- **In many countries VHF frequencies are still used by analog TV:** many countries still haven't fulfilled international obligations and didn't finish transition to digital TV (deadline was on 17th of June 2015), that's why project proposes creation of additional infrastructure for digital mobile TV and radio broadcasting on VHF frequencies in order to help local governments with transition and to make VHF spectrum free of analog signals

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Opportunities

- **Spectrum sharing**
- **Cooperation with Global Connect Initiatives:**
 - Project Loon,
 - Google & Facebook Solar drones,
 - OneWeb & SpaceX LEO microsatellites

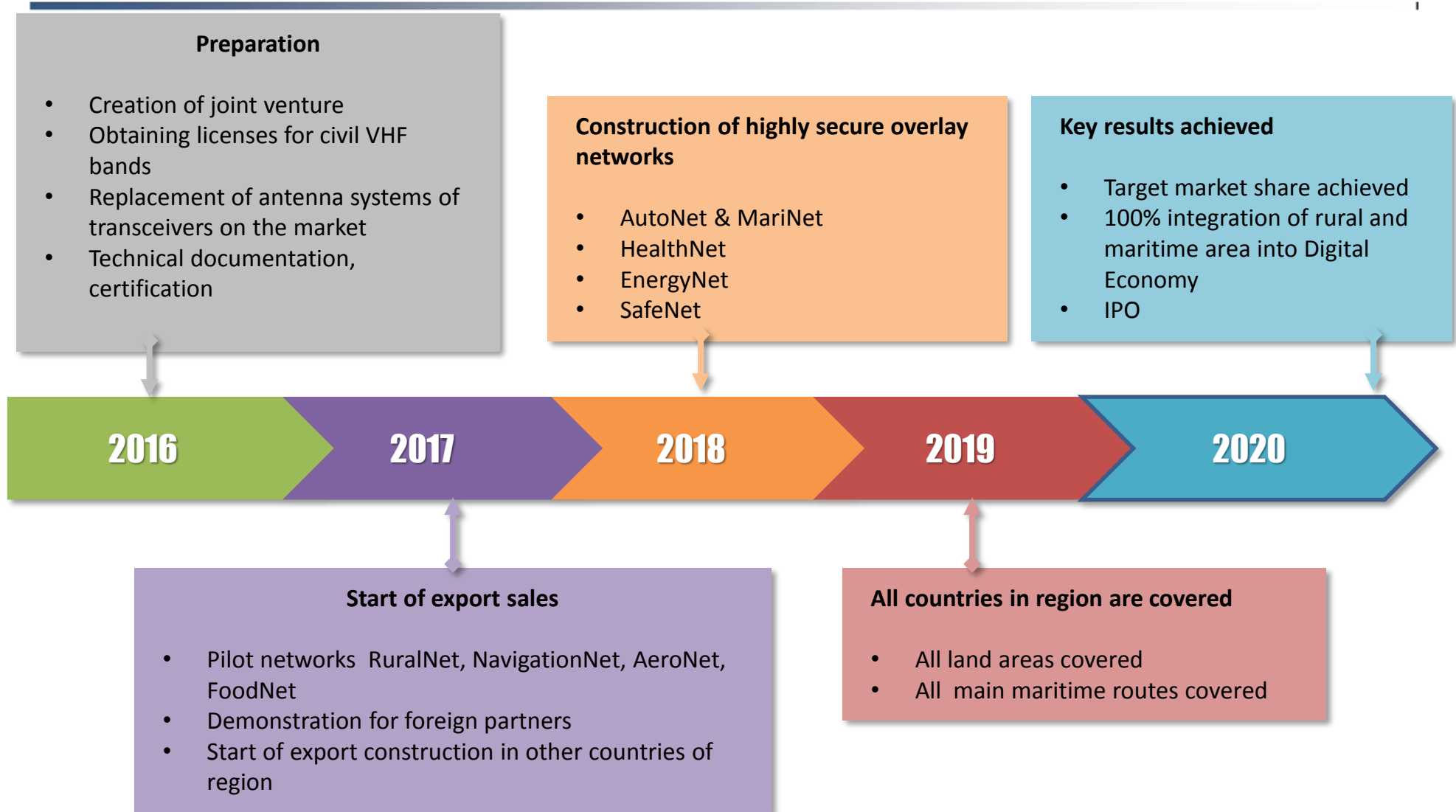
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Threats

- **Reverse engineering:** all schemes will be covered with special nanocapsules and when opponents will X-ray (or like that), the heat would be increased and all schemes will be destroyed

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Milestones



Key results

Digital economy, information society and sustainable development of rural and maritime areas



New markets and nationwide services



New jobs and specialties, especially for young people with disabilities



Increase of GDP



Sustainable Development

About us

Genesys Technologies LTD is a team of top specialists in the field of wireless communications, cybersecurity and unmanned systems.

During many years we are actively consulting:

- **FCC:** Federal Communications Committee
- **FAA:** Federal Aviation Administration
- **DARPA:** Defense Advanced Research Projects Agency
- **DOD:** Department of Defense
- **US Congress**
- **UN project office on governance**