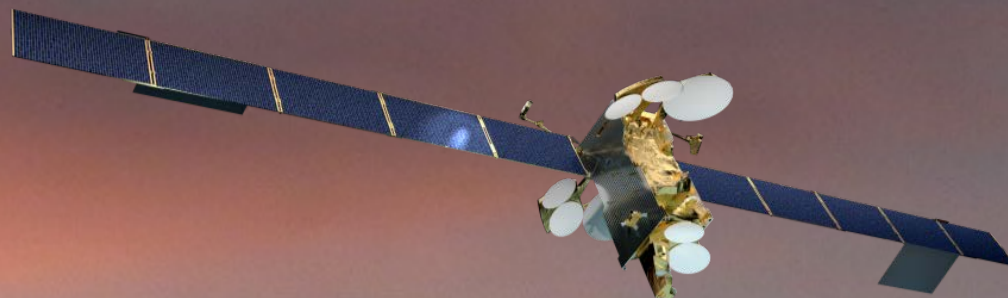


Promising avenues of market development for satellite communication services in the Republic of Kazakhstan



Nurshabekov R.R.

Director of the “State Radio Frequency Centre” RSE

Saint-Petersburg, June 2018

Current status of the Kazakhstan satellites



Prospective projects



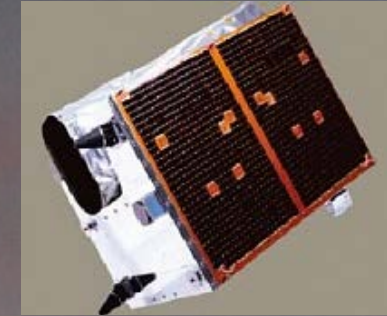
KazSat-2R

Communication and broadcasting satellite for providing e-government, broadcasting services, telephony, data transmission, multimedia services and mobile communications services.



KazEOSat-3

High-resolution Earth Remote Sensing Space System of the Republic of Kazakhstan



KazEOSat-4

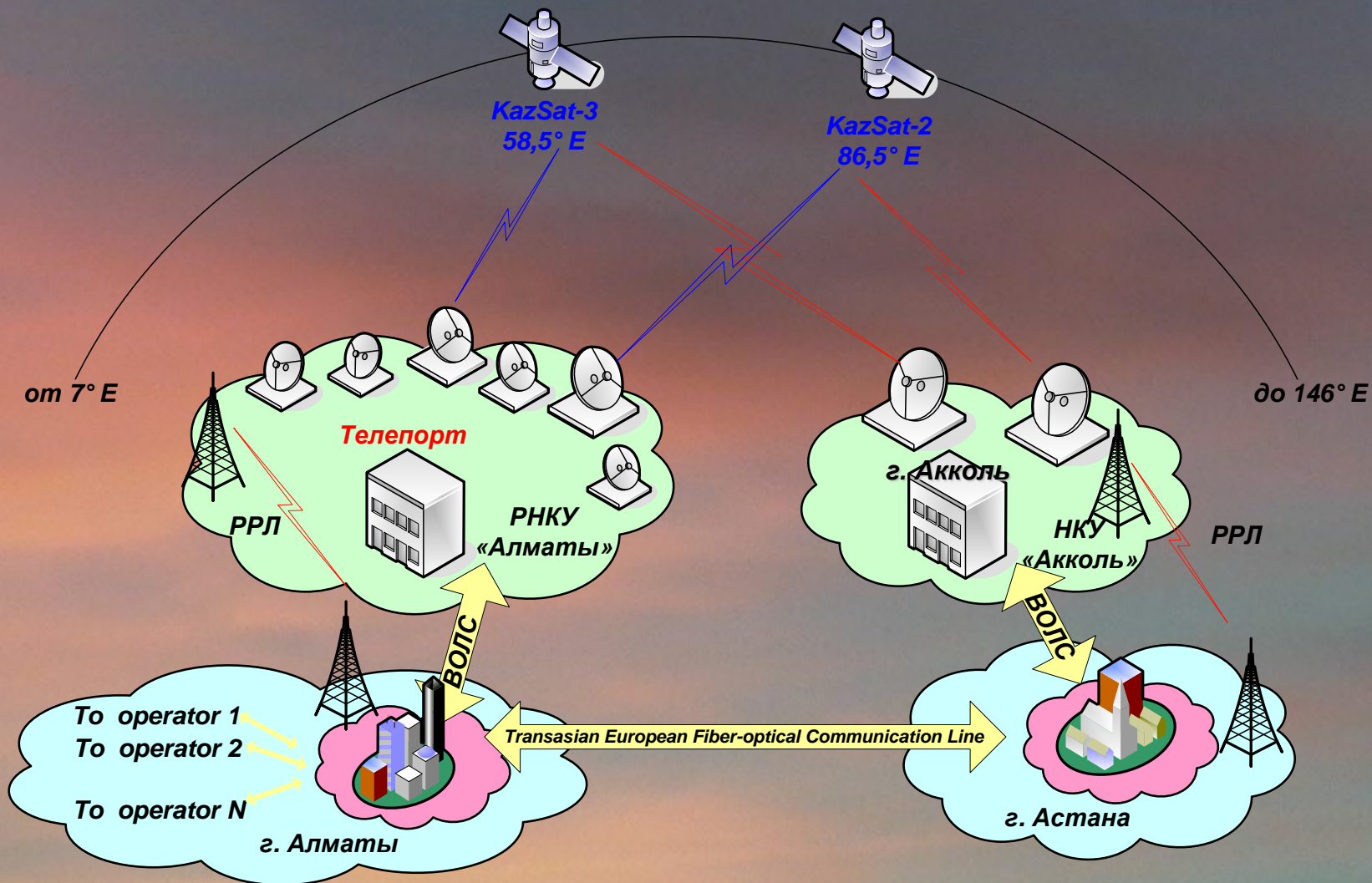
Medium Resolution Earth Observation Space System of the Republic of Kazakhstan

Major projects of International Orbital-Frequency Coordination Service in Kazakhstan



Satellite	Statuses	Satellite network		Orbital position	Bandwidth	Launch date
KazSat-2	Active	KAZSAT2, KAZSAT2M, KUPON-4M (Russian network)		86.5 E.L.	C, Ku	15 July 2011
KazSat-3	Active	Beam 1	KAZSAT1, KAZSAT1M	58.5 E.L.	C, Ku	28 April 2014
		Beam 2	KAZSAT-30B-58.5E			
			KAZSAT-30B-58.5E-2			
KazSat-2R	Planned	KAZSAT networks of R/S series		-	C, Ku, Ka	2018-2023
KazEOSat-1	Active	DZZ-MR		NGSO	S, X	June 2014
KazEOSat-2	Active	DZZ-HR		NGSO	S, X	April 2014
KazSTSat	Planned	KazSTSat		NGSO	S, X	2 nd half of 2018
KazSciSat	Planned	KazSciSat		NGSO	S, VHF	2 nd half of 2018
Al-pharabi-2	Planned	Al-Farabi-2		NGSO	VHF	2018-2019
KazEOSat-3	Planned	KazEOSat-3		NGSO	FSS Plan	2021-2022
KazEOSat-4	Planned	KazEOSat-4		NGSO	BSS Plan	2021-2022
National allocation	Allocation	KAZ00000		58.5 E.L.	FSS Plan	-
National allocation	Allocation	KAZ06600		56.4 E.L.	BSS Plan	-

Services provided by satellite communication operators in Kazakhstan



Provided services

- E-government
- Broadcasting services
- Telephony
- Data transmission
- Creation of VSAT networks
- Multimedia services
- Mobile communications

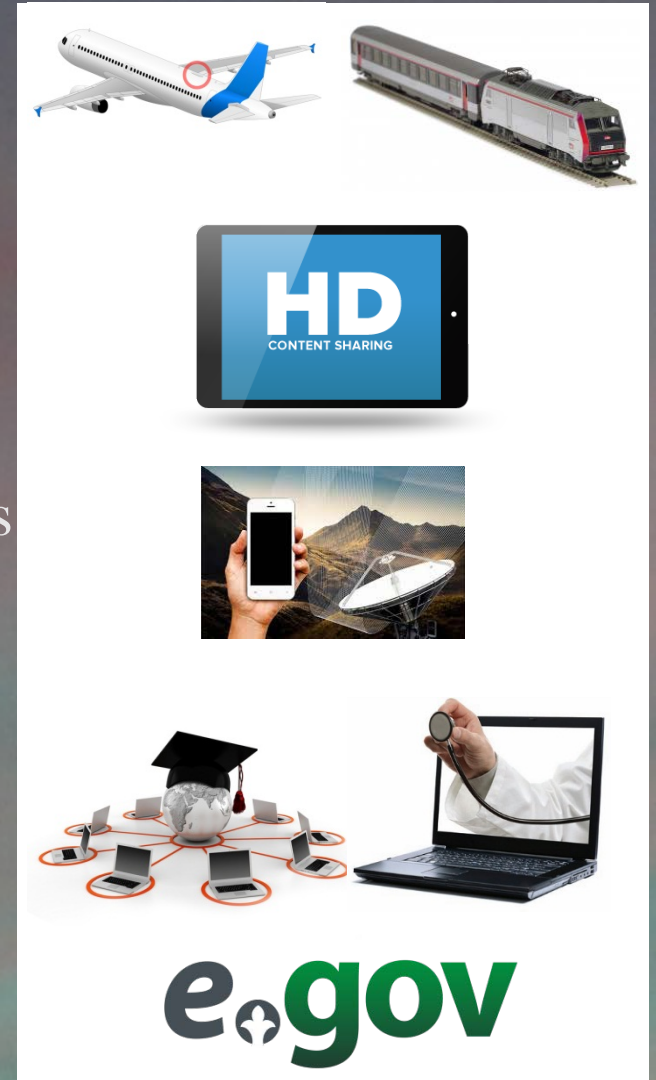
Ground Control Station:

- «Akkol» CSC
- «Kokterek» RCSC

16 satellite communication operators

Perspective directions of satellite communication in Kazakhstan

- Provision of Broadband Services in transportation systems (airplanes, trains, buses, etc.);
- Development of satellite high-definition television (HD TV);
- Backhaul Networks for Broadband Mobile Communication Networks (3G/4G/5G/Wi-Fi and etc.);
- Provision of multimedia services (distance learning, telemedicine);
- Providing services for e-government



«Digital Kazakhstan»

Digital Kazakhstan State Program was approved in December 2017. This is an important comprehensive program aimed at improving the standard of living of every citizen of the country through the use of digital technologies. Considering that the territory of the Republic of Kazakhstan occupies the 9th place in the world and has one of the lowest population densities, therefore issues of providing broadband services in rural and remote areas through satellite technologies are currently being explored.

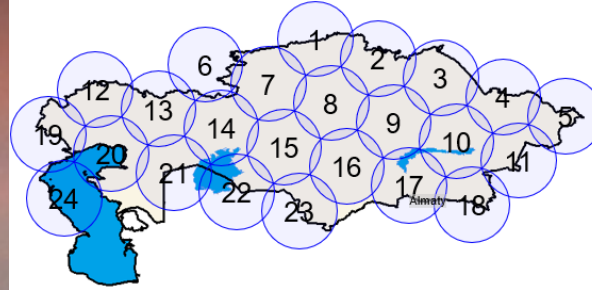


Provision of broadband services using satellite technologies

Broadband services in rural areas with various satellite technologies



Traditional Ku-band
KazSat-2R



Ka-band multibeam solutions



NGSO Systems
(LEO/MEO)

Possible risks in the provision of Broadband services with the help of new satellite technologies

1. Illegal import of satellite user terminals of NGSO and HTS systems.
 - *Possible ways to address:* mandatory registration procedure in the authorized communication agency;
2. Possible interference from non-GSO FSS to existing GSO satellites
 - *Possible ways to address:* creation of a joint regional satellite monitoring system;
3. Updating the database of regulatory and legal documents for NGSO FSS in the countries of regional commonwealth in the field of communications
 - *Possible ways to address:* joint elaboration of regulatory and legal documents regulating activity of NGSO FSS operators

THANK YOU FOR YOUR ATTENTION!

QUESTIONS?