GLONASS Union is a Non-profit Partnership

- National navigation services provider
- Government contractor for building the ERA-GLONASS System
- Partnership of Navigation-based Services market leaders
National Initiative to Increase Safety on Russian Roads

- Saving up 4 000 lives annually
- Decrease of disabilities and fatalities
- Mitigation of road accident consequences severity and liquidation costs
- Economical effect is expected to reach 22 billion Rubles by 2020

* Estimations done assuming 100% vehicles are equipped with ERA-GLONASS IVSs

Harmonization with European eCall
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2009</td>
<td>Project approved by the Commission for Modernization and Technological Development of Russia's Economy</td>
</tr>
<tr>
<td>May 2010</td>
<td>First State Contract for ERA-GLONASS design and deployment is signed</td>
</tr>
<tr>
<td>2012</td>
<td>Ministry of Transport takes over a role of Sate Customer form Roscosmos GLONASS Union appointed as sole Contractor</td>
</tr>
<tr>
<td>30 January 2013</td>
<td>Amendments to Technical Regulation of Vehicle Safety are adopted</td>
</tr>
<tr>
<td>December 2013</td>
<td>The Federation Council approved the Federal Law on ERA-GLONASS System</td>
</tr>
<tr>
<td>2014</td>
<td>ERA-GLONASS System is put into pre-production operation</td>
</tr>
<tr>
<td>2015</td>
<td>Service is available for the vehicles with ERA-GLONASS OBU</td>
</tr>
</tbody>
</table>

4 years from the idea to realization!
ERA-GLONASS development

2010

1. Start of ERA-GLONASS project (Government Contract signed)

2011

1. System design -> Planning -> Deployment

2. Legislation and Regulatory Framework development

2012

3. In-Vehicle System requirements definition

2013

4. Emergency Response Services interplay definition

2014

Operations start in 2014

Service to start in 2015

May 2010

Operations start in 2014

Service to start in 2015

Integration to major MNOs and System-112

Legislation and Regulatory Framework development

May 2010

Start of ERA-GLONASS project (Government Contract signed)
Service available in each region of Russia

ERA-GLONASS footprint

Federal roads coverage*
- MTC 91%
- Megafon 94%
- Beeline 85%

ERA-GLONASS 99%

* Official data, as of Dec 2013

MVNO Infrastructure - 80 Nodes

2011 • 2 Central nodes + 1 Regional node (MSK, SPB, Kursk)
2012 • 15 Regional nodes (3 NIC + 12 RKU)
2013 • 62 Regional nodes (3 NIC + 59 RKU)
1. Transmission of the emergency call through GSM networks

2. Emergency calls decoding, processing, and recording

3. Emergency response
Major differences of ERA-GLONASS and eCall

**Mandatory requirements**
- GLONASS GNSS support - a MUST
  - Combined GNSS receivers (e.g. GLONASS/GPS/Galileo) - welcome
- MSD transmission
  - In-band (primary method – standardized by 3GPP)
  - SMS (backup mechanism)
- Extended Echo Cancellation and Noise Reduction requirements for IVS
- Test requirements:
  - Test call to be initiated from a vehicle, results to be transmitted to back-end
- UMTS 900/2100 support
- Standardized I/O port and standardized protocol for external sensors
- Multi-profile eUICC with ERA-GLNOASS MVNO profile

**Optional requirements**
- Remote IVS management (mandated for Retrofit IVS only)
- Remote IVS software upgrade (mandated for Retrofit IVS only)
- Crash Acceleration Profile recording for crash severity estimation in the back-end system
- “Black box” function (raw data storage)
Major differences of ERA-GLONASS and eCall

- Single point of responsibility for operations and maintenance of emergency infrastructure
- Cumulative cellular coverage though all Federal roads of Russia. IVS registers in available PLMN
- Dedicated SMSC as MSD backup bearer
- Carrier grade PLMN breakouts with major Russian mobile networks
- Redundancy of hierarchal architecture (three levels network: Federal, Macro-regional, Regional)
- Filtering Call Center of few agents to qualify emergency calls countrywide (83 regions)
- IVS testing subsystem used for vehicle periodic technical inspection
- Base for public Services (road accident prevention, insurance telematics, digital tachygraphy, road tolling, …) and variety of consumer Value Added Services
Potential for Value Added Services

- Road tolling, Tachographs
- SVT, b-call, i-call, etc.
- Concierge Service
- Insurance Telematics
- Concierge Service
- Infotainment

Government (G2C)
Corporate (B2B)
Consumer (B2B2C)

Telematics Server
SDP
Portal
CRM, Billing
Contact-center

MVNO, own dedicated Backbone

- Fleet Management
- Road tolling, Tachographs
- ITS
- Crash reconstruction
- SVT, b-call, i-call, etc.
- Insurance Telematics
- Concierge Service
- Infotainment
Thank you