Technological challenge 1

Departments that propose the **challenge:**
- Ministry of Environment, Territory and Infrastructures
- Ministry of Maritime and Rural Areas

1. Areas/topics that the department wishes to investigate/innovate with the aim of improving the delivery of public services through UAVs.

1. Capture of geographical or territorial information and elaboration of cartography. Integration and hybridisation of geographical information capture systems. Automation for obtention of the end product. Adjustment of processes for obtaining products and their use by end users. "Continuous" update of geographical information.

2. Agroforestry resource management from Lidiar data and images obtained by UAVs.

3. Application of information supplied by UAVs in the analysis and planning of the territory.

2. - Activities or intensive processes in department resources that can improve through the use of UAVs based solutions.

1. Capture of geographical information.
   - Using different devices and hybridisation data capture systems for updating the information of the territory: Terrain Models, infrastructure, construction, cover and use, forest inventory information at the level of mountain soil information.
   - Automation of the processes for obtaining information related to the above topics.

2. Agroforestry resource management.
   - Fire prevention and combating forest fires
   - Inventory and forestry management
   - Improves mobility over agricultural land.

3. Development and monitoring of studies and spatial plans.

3. - Technical or technological challenges that should solve these solutions (this section includes the integration of solutions into existing processes or technological platforms department)

1. - The capture of geographic information and mapping development challenges are:
   - The integration of different technologies for capturing information.
   - Automation in processes for obtaining necessary geographical information.

2. - Management of agroforestry resources, challenges include development and calculation, from the information supplied by the UAVs, of:
   - Fuel models and fire risk index
   - Estimation model of existential timber-yielding and volume of non-timber-yielding biomass (characterisation of the resource biomass)
   - Phytosanitary state indices of vegetation, especially arboreal
   - Procedures for recognition, evaluation and prediction of the degree of abandonment of agricultural plots and support systems for reorganization.
   - Index for the control of the assistance by maintenance of bushy and arboreal pasture.

3. - The study and planning of the territory, the challenges involve the use of data obtained by UAVs for:
- Control and monitoring of land use plans, for example, for automatic calculation of monitoring indicators of the Planning Guidelines for the identification of new buildings in the protected areas of the Coastal Management Plan to obtain information on the height of buildings, etc.
- The elaboration of historical series of land use models that calibrate land use change models (Land Use / Cover Change models) tailored to the regional characteristics of Galicia
- Feeding Support Systems Planning (*Planning Support Systems:* PSS) and develop specific PSS for Galicia employing UAVs data for decision making in territorial planning.

4. - Management and technical team provided by the department with technological partner.

Multidisciplinary technical personnel with experience in capture, management and of territorial and geographical information, as well as in the realization of different types of territorial studies.

Team training: engineers in topography, architects, agronomists, Engineers in forestry , graduates in geography, graduates in geology, graduates in biology, graduates in environmental science , graduates in exact sciences, graduates in telecommunications and specialist operators.

5. - Operational improvement, process optimisation, cost reduction ... that it expects to achieve by implementing solutions based on UAVs

1. Capture of geographic and land information:
- Cost reduction in the capture of information.
- Adjustment of developments for automatic information collection, reducing costs and timing.
- Continuous updating of geographic data.

2. - Agroforestry resource management:
- Improved efficiency in fire prevention and response times in firefighting thanks to the availability of fire risk mapping, real time monitoring of fires and predicting the evolution of fires based on models.
- More accurate and updated forest inventories, which result in the more efficient forest management.
- Quantifying, modelling and prediction of the abandonment of agricultural land will facilitate the design and implementation of policies and instruments of land management, for example, the Bank of Terras de Galicia.
- Cost reduction in the CAP management subsidies and higher reliability.

3. - Study and planning of the territory:
- Development of regional studies with higher spatial and temporal precision.
- Greater efficiency and agility in decision making processes of territorial planning through the availability of simulation models and systems for decision support tailored to the regional characteristics of Galicia and fed with data from UAVs.
- More efficient and accurate monitoring of land use plans by reducing costs and time in the calculation of monitoring indicators and the availability of new data