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## MUNICIPAL AVIATION FUNCTIONING AS ONE OF FUTURE TYPES OF THE AVIATION ACTIVITIES

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### Abstract

*In the article we represent the basic principles of municipal air transport within the metropolis. The main tasks of creating municipal transport are defined to further develop of aviation technologies for municipal economy and life support of the city and its air-transport system. In order to further development of aviation technology in the interests of the urban economy and life of the city, its air transportation system is necessary to decide three main objectives: development of aviation equipment and saturation of City Aviation park by light helicopters which will ensure solving of special tasks for the benefit of urban services, commercial transportation and air operations; development of urban aviation infrastructure, including heliports and helipads; the organization of safe use of the airspace over the city. The use of technology in aviation can be done while ensuring sanitary and environmental standards of environmental protection.*

**Keywords:** aviation; aviation technologies; air transport system; municipal aviation

### 1. Introduction

Experience of the largest megacities of the world testifies to the widespread use of aviation and aviation technologies for municipal services and the viability of the city.

In the US and Western Europe are developed air transport system, which includes dozens of owners, operators, large and small heliports for helicopters, of which a significant part is private. These systems are developed according to plans of cities and regions. While the general trend to limit the activity of large airports, inside cities, and leaving the city limits, developed infrastructure heliports and helipads[1,2].

Megapolis, as one of the greatest cities in the world, objectively feels the need to address a number of problems inherent in cities. Among them is need to increase the speed of response of city services (primarily law enforcement, emergency, fire, emergency medical care, etc.) in reduced bandwidth of highways and, as a result, difficult

road traffic, especially in emergency situations. In addition, high population density and large number of functionally interrelated objects, greatly increase the risk of the consequences of industrial accidents, which requires continuous monitoring of environmental engineering and other technical systems and communications. The use of air assets (and, primarily helicopters) makes it possible to solve the above problems.

Solving the problem of aviation public transport (APT) has been made possible due to:

- The organization and the division of the Ukrainian airspace classes by order of the Ministry of Transport on 16.04.2003, № 293 (Ministry of Justice of 05.05.2003, the № 346/7667) "On approval of the Rules of aircraft operations and air traffic service in classified airspace Ukraine";

- The development of metropolis infrastructures, particularly in Kyiv;

- The development of robust aircraft capable of meeting the requirements for air transport, which is used in urban areas [3];

– Development of scientific and technical means to ensure the monitoring of the state of the APT system in all the required aspects, namely: to ensure safety, ensure monitoring of compliance with the Rules of the Organization permit system, control environmental conditions, etc. out of sight of the radar supervisory and supervisory control using elements of CNS / ATM technologies in the lower airspace[3].

Based on the technical possibility of implementing the APT system in the State Aviation Administration of Ukraine (SAA) by the the Administration of the President of Ukraine, the Cabinet of Ministers of Ukraine, Kyiv State City Administration and a number of air transport operators were sent reasonable inquiries about the possibility of the flights within the Kyiv municipality boundaries and to perform landings in urban areas. In the SAA the question is being discussed.

In addition, in the implementation of the APT system is interested a number of ministries and departments of Ukraine in particular for the implementation of medical aviation functions, search and rescue aviation, providing evacuation assistance to people from high-rise buildings in case of fire, law enforcement supervision, the transport of passengers, including VIP senior management country and city authorities.

The decision to implement the APT system will significantly accelerate the development of conceptual programs for the development of private aviation in Ukraine and related technological systems that can lead Ukraine on the high technological level of the organization and control of general aviation up to the statements of a number of international standards.

The positive effect of the implementation of AMT system is to increase the volume and circulating financial resources of the municipality, the municipal budget revenue and investment income from the provision of high-value services, the creation of a large number of jobs requiring highly skilled personnel.

Application of specific aviation equipment in municipal conditions can increase the interest of developers and manufacturers to fill this market by national developments[6,7].

## 2. Subject

The subject of this summary is to present the conceptual principles of the system of public transport aircraft, offering the concept of "Programme implementation system and the economic feasibility of its operation."

## 3. The concept of APT system organization

The main objectives of the APT system are:

- Development of air transport system of Kyiv;
- Improving the application of aviation technology in the interests of urban services and to ensure the city life;
- To ensure environmental safety in the city and its population, related to aviation activities.

*AMT system structure consists of the areas:*

1. The contour of consumers of aviation technology services.
2. The contour of owners and investors of system parts.
3. Operators of air transport.
4. Standardized Aviation municipal equipment.
5. Infrastructure ensuring flight operations:
6. Normative – legal field of System functioning.
7. Control of the technical state of the system.

*1. The contour of of consumers of aviation technology services.*

Consumers of urban air transport system are:

- Medical institutions of first aid;
- Burn centers and intensive care medicine;
- Emergency Situations Ministry units evacuating from areas of fire from the roofs of high-rise buildings;
- Search and rescue units of Emergency Situations Ministry;
- Ministry of Internal Affairs patrol division;
- Transportation of VIP guests;
- Tourist flights;
- Passenger transportation by sectors of the municipality.

In the process of implementing the APT system is possible phased introduction of consumers.

*2. Contour owners and investors to parts of the system.*

Holders of APT system should be divided into categories:

- a) Owners of aviation technology – operators.
- b) The owners of landing sites and of locations.

c) Holders of labeling systems, lighting and radio support.

d) Contractors mount high-rise and high-rise buildings construction system.

d) Owners of refueling points and fuel supplies APT.

e) Owners of an information network system APT.

g) The owners of the field GPRS networks and information channels.

h) Manufacturers of APT system on-board hardware.

The owner of any of the components may be any investor. The priorities for the municipality of ownership may be the objects of AMT system:

- The operator;
- Landing sites and home base;
- Refueling points and APT supplies.

### 3. Operators of air transport:

- Medical first aid institutions, the Ministry of Health or the operators of the contractual party;
- Burn centers and intensive care medicine;
- Emergency Situations Ministry or Emergency Situations Ministry operators contracting party;
- Ministry of Internal Affairs;
- Organization or contractual operators transport VIP guests;
- Operators of air transport;
- Private individuals.

The main operator of the municipality may be in the municipal area.

### 4. Standardized Aviation municipal equipment.

In accordance with the concept of the system of public air transport system by the aircraft can serve machines with features:

- Having FAA and JAA type certification;
- The possibility of mandatory vertical takeoff and landing;
- Dimensions of no more than 3 m (width), the X 10 m (length), the X 5 m (height);
- Maximum take-off weight up to 5700 kg .;
- scope of lifting surfaces within a radius of no more than 8 meters, D = 16 m;
- The height of the rotor carrying surface not less than 2 meters;
- At least two engines, and with the possibility of horizontal flight at an altitude of 250 meters at the failed critical engine at maximum take-off weight;

– With a maximum payload have a minimum amount of fuel on a flight of at least 2 hours;

– Static ceiling of not less than 150 m at the failed critical engine with a maximum take-off mass;

– On-board de-icing equipment, the system;

– Automatic fire-fighting equipment and means of rescue of passengers;

– Required by the standard light-beacon and radio markings, required instrumentation[4,5].

Standardized requirements for municipal aviation technology should establish SAA.

### 5. Infrastructures ensuring flight operations:

– landing sites and platforms on high-rise buildings in the city;

– home base and technical maintenance of aircraft;

– APT refueling point and expendable materials;

– light-technical and radio software sites and places of APT basing;

– light-technical and radio software of flight safety in the city;

– automated licensing system of APT production operations;

– automated control system of safe flight operations in the city;

– aeronautical and information providing of urban air transport.

– register of high-rise buildings (N = 50m and more) in Kyiv and Kyiv region .

A detailed presentation of the principles of organization of the system infrastructure is invited to present in the program.

### 6. Normative – legal field of system operation:

– technical standards of aviation municipal equipment;

– requirements and standards applicable to the landing sites and systems ensuring the functioning of platforms;

– flights rules in municipal areas;

– aeronautical requirements and implementation schemes of flight routes in the municipal areas;

– training requirements for flight personnel and system of tolerances to operate in municipal areas;

– standards for building system objects in the State Building Standards (DBN);

– requirements and standards for marking, light-technical and electronic signaling systems;

- requirements for the information system of flights in the municipal area;

- regulatory support flight operations permit system in the municipal area.

Normative – legal framework is being developed the SAA. To speed up the implementation process is proposed to develop regulatory and legal aspects on a tender basis, at the announcement of the tender for these works by the SAA.

#### *7. Control of the technical state of the system:*

- periodic monitoring of airworthiness of APT;
- continuous monitoring of readiness of flight personnel to flight operations in the municipal area;

- constant monitoring of compliance with the standard landing sites and providing take-off-landing systems;

- constant monitoring of the deviation from the technical standard of the lighting and radio engineering marking obstacles;

- continuous monitoring of the status of the information field of the system;

Regulatory control over the quality of functioning of the system should carry out SAA or organization for which were delegated these rights by the SAA.

Technical control of the functioning of the system is carried out by organizations performing technical support of the system components, including warranty conditions.

#### **4. Sources of start-up capital and persons involved**

For each element of the system start-up capital of APT can be any investment or credit of figurant. Just from the standpoint of the municipality can be seen as an investment not financial assets but assets in the form of extracted from the municipally owned system objects ( landing sites, base sites, locations of refueling stations, etc.) adequately evaluated.

Each person involved determines the source of its funding of the infrastructure by themselves.

Considering that the system is able to function only in deriving the full capacity of all the elements, otherwise it simply will not work, municipality should act as a distributing entity for the selection of investors who prove their ability to participate in the

project of construction of the APT system and are responsible in the case of conditions of violations contract. The head of the APT system must act its designated municipality and the authorized subdivision.

The distribution of financial sources for the construction of elements of the AMT system is determined by the Municipality, and is entered in the realization program.

#### **5. The expenditure and revenue of the persons involved**

Each person involved himself defines sources of funding to maintain its system cell, considering the costs as cost of services offered.

The revenue part has to be paid by the consumer of system services under the ordinary legislative normal deductions.

The source of income of each element of the system can be described directly in the program during the discussion with the Municipality.

#### **6. Conclusions**

At the moment the SAA has set a number of tasks for the development of regulatory and legal aspects of the system elements. But the SAA is not united these tasks in the realization problem of AMT system. Therefore, the problem is not solved in a complex and is likely the result of several problems which will not be enough for the realization of the whole system.

We must pay tribute to that international aviation legislation such activity as a municipal air transport is not regulated and is provided to address the state directly aviation authorities. But until recently, so the question was not raised at all, and therefore developments or sufficient experience in dealing with this problem in the SAA not and was not. And the question is serious due to responsibility to third parties in the event of an aircraft crash in the vicinity of the municipal buildings. Any statistical or experimental data on the specific conditions of the municipality also does not exist. It is therefore proposed realization of program of the system development carefully, cautiously in small steps, with the gradual accumulation of the necessary statistical material and sufficiently flexible regulatory – legal system. It is not acceptable for each adjustment of the rules in

accordance with reality, constantly line up in the Cabinet of Ministers, the Ministry of Justice or the Supreme Council of the queue for ratification.

From a technical point of view the project has long been matured, and all technical aspects have been tested in production.

It is proposed, on behalf of the Municipality and with his direct participation to develop the "Program of development of the aviation public transport of the system of Kiev until 2015," which detail the guidelines and economic feasibility of each system element. Accordingly, to prepare material for a tender or competitive investment for the implementation of the Programme. The program will determine the tariff plan element by element, and in order to determine the profitability of the project at every stage of implementation [5,6].

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**Функціонування муніципального авіаційного транспорту як один з майбутніх видів авіаційної діяльності**

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Представлені основні принципи муніципального повітряного транспорту в межах мегаполісу. Основні завдання створення муніципального транспорту визначені для подальшого розвитку авіаційних технологій для житлово-комунального господарства, життєзабезпечення міста та його повітряно-транспортної системи. З метою подальшого розвитку авіаційної техніки в інтересах міської

економіки й життя міста, необхідно вирішити три основні завдання: розвиток авіаційної техніки і насиченості міста авіаційного парку легкими вертольотами, які забезпечать розв'язання спеціальних завдань в інтересах міських служб, комерційних транспортних і повітряних операцій; розвиток міської інфраструктури авіації, в тому числі вертодромів і вертолітних майданчиків; організація безпечного використання повітряного простору над містом. Використання технології в авіації може бути здійснене при забезпеченні санітарних та екологічних норм охорони навколишнього середовища.

**Ключові слова:** авіація; авіаційні технології; авіаційно-транспортна інфраструктура; муніципальна авіація.

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**Функционирование муниципального авиационного транспорта как один из будущих видов авиационной деятельности**

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Представлены основные принципы муниципального воздушного транспорта в пределах мегаполиса. Определены основные задачи создания муниципального транспорта для дальнейшего развития авиационных технологий для городского хозяйства и жизнеобеспечения города и системы воздушного транспорта. В целях дальнейшего развития авиационной техники в интересах городского хозяйства и жизни города ее авиатранспортная система необходима для решения трех основных задач: развития авиационной техники и насыщения городского авиационного парка легкими вертолетами, что обеспечит решение специальных задач в интересах городских служб, коммерческих перевозок и воздушных перевозок; Развитие инфраструктуры городской авиации, включая вертодромы и вертолетные площадки; Организация безопасного использования воздушного пространства над городом. Использование технологий в авиации может быть достигнуто при обеспечении санитарных и экологических стандартов охраны окружающей среды.

**Ключевые слова:** авиация; авиационные технологии; авиационно-транспортная инфраструктура; муниципальная авиация.

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