Tivat airport development

General information

This project regards the **modernisation of the Tivat airport**. The airport is the second in Montenegro after that of the capital city Podgorica and serves the Adriatic coast around Tivat and the surrounding region.

The Tivat airport occupies a favourable position, being located on the South-Eastern coast of the Tivat Bay on the M2 motorway (i.e., E80/E65, the Adriatic highway), which connects the coastal cities and Montenegro with the neighbouring countries[1].

The Tivat Airport exists on the current location as far back as 1957, when a grass runway (i.e., 1.200 m long and 80m wide), an apron and a terminal building were built. In the period from 1968 to 1971 the airport was deeply modernised. A runway with asphalt pavement (i.e., 2.500 m long and 45 m wide), an apron (i.e., 450 m by 70 m), a terminal building, a control tower, an administration building and the accompanying technical and service facilities were built. The current borders of the airport date from that period.

From then until 2005, only interventions of a limited scope have been carried out to increase the capacities of the terminal building and apron, as well as the rehabilitation of the facilities after the earthquake of 1979. During the years 2005 and 2006, a general reconstruction and expansion of the terminal building was carried out and a modern technological equipment was built in.

Since its activation, the airport has dealt with problem of **insufficient space**. Analysing the interventions developed through time, all projects and plans identified compromise solutions, balancing the space available with that required for operating the airport.

Regarding the above, the current layout does not meet the recommendations according to international standards set on the space required along the sides of the runway. Moreover, all spatial reserves for future development have been exhausted. With respect to the transport demand, the current capacity is insufficient to handle seasonal peaks, the airport often overcrowded and flights delayed.

The modernisation project seeks to address these issues by **increasing the handling capacity** of the passenger terminal and **improving service quality** as well as achieving compliance with requirements of ICAO by improving conditions of the airside.

In 2003, the **ownership** of the airport was transferred from Jat Airways to Airports of Montenegro, which is a public company owned by the Government of Montenegro. In 2014, the company was transformed[2] into a joint stock company tasked to a stepwise modernisation as well as assessing the possibilities of introducing night operations and low visibility operations.

As far as the **relevance of the project is concerned**, the Spatial Plan of Montenegro defines the role of the Tivat Airport and the strategic commitment for further spatial development of the airport space as a prerequisite for tourism development in Montenegro. The project has been included in the SEE2020 Air Transport Strategy and a detailed development plan was elaborated in 2013 (MonteCEP and CEP, 2013).

The **project promoter** is the Airports of Montenegro.

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1 For example, with Budva (27 km), Bar (64 km), Kotor (10 km) and Herceg Novi (18 km by ferry).

2 As agreed between Civil Aviation Agency of Montenegro and the Government of Montenegro.

Technical description

The project foresees the extension of the existing facilities and plans the airport development through **four main components** to address both airside and landside bottlenecks. In this respect, additional handling capacity is an identified need for the passenger terminal and additional aircraft stands can provide sufficient capacity for the next ten years and improve service quality.

Three components relate to the airside and one to the landside**.** The figures below illustrate the main features of components 1, 2 and 3 of the development plan**.**

- Component 1: rehabilitation of the pavements structure of the maneuvering area and apron, including runway lighting equipment (see Figure 6-1).
- Component 2: widening of the commercial aviation apron, its link taxiways and holding bays to the runway (A and B), three new proposed taxiways (C, D and S) and several utilities (see Figure 6-2). This component also includes (i) the sub-component 2/A for apron widening with the new link taxiway service road and utilities (see Figure 6-3) and (ii) sub-component 2/b to relocate the Tivat-Ostrvo Cvijeca road (see Figure 6-4).
- Component 3: displacement of the runway thresholds (14 and 32) in order to comply with ICAO safety regulations (see Figure 6-5).
- Component 4: consists of the concept designs for new terminal building (i.e., 13.000 m^2), reconstruction of existing building (i.e., 4.052 m^2) and new parking and access roads. The new passenger terminal will be in conjunction with the existing terminal.

The project did not develop other alternative solutions or variants.

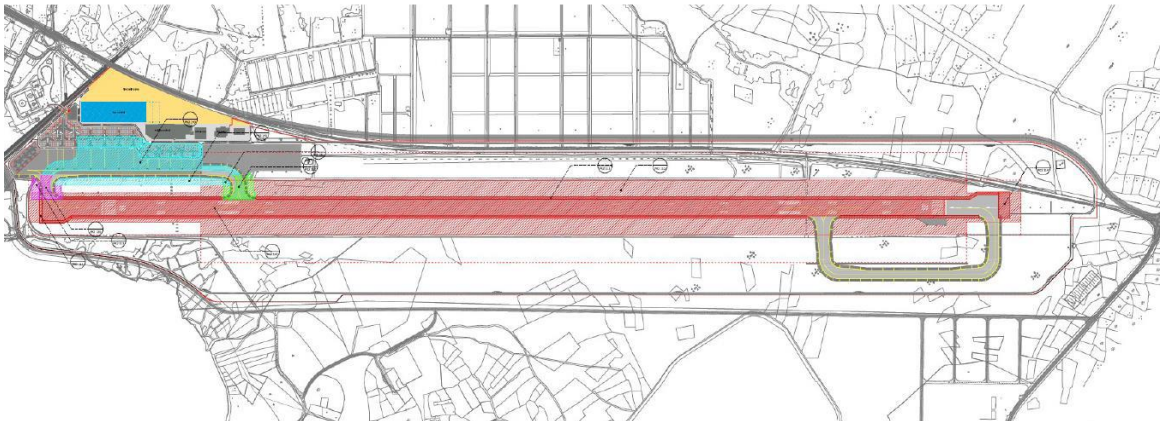
According to the consulted stakeholder, the **estimated investment cost** is equal to approximately € 55 million (excluding VAT). Partial figures provided on costs breakdown indicate that € 23 million are foreseen for the construction of the new terminal building, € 4 million for the reconstruction of the existing terminal building, € 23 million for airside works and € 2,5 million for parking and access roads.

This costs estimation updates the previous one of MonteCEP and CEP (2013), equal to € 53,8 million[3].

The estimation of operating and other expenses was based on historical data of 2010 and 2011 and reported equal to € 6,7 and € 5,8 million, respectively. The dominant share regards the outflow for salaries and other personal incomes. The average share is equal to 55% and shows an increasing tendency.

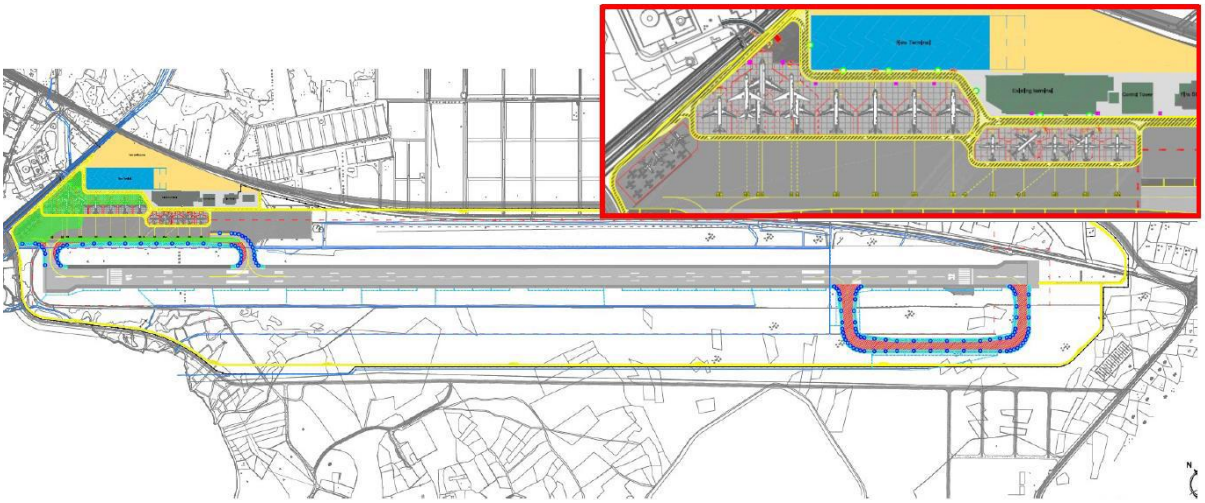
[3] In this estimation, the largest investment components were anticipated for developing manoeuvring areas and aprons (i.e., € 20,6 million) and for demolition and construction of new terminals (i.e., € 16,5 million). Together, these account for 69% of the total estimated investment costs. The study of MonteCEP and CEP (2013) provides with a detailed assessment of investment costs breakdown.

Figure 6-1: Component 1 - Rehabilitation of the pavement structure of the manoeuvring areas and apron



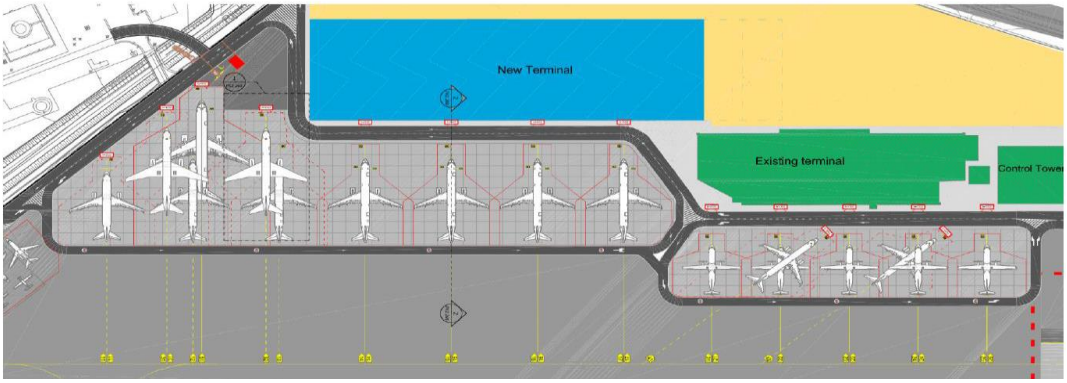
Source: Concept Design document

Figure 6-2: Component 2 - Apron widening with the new link taxiway service road and utilities



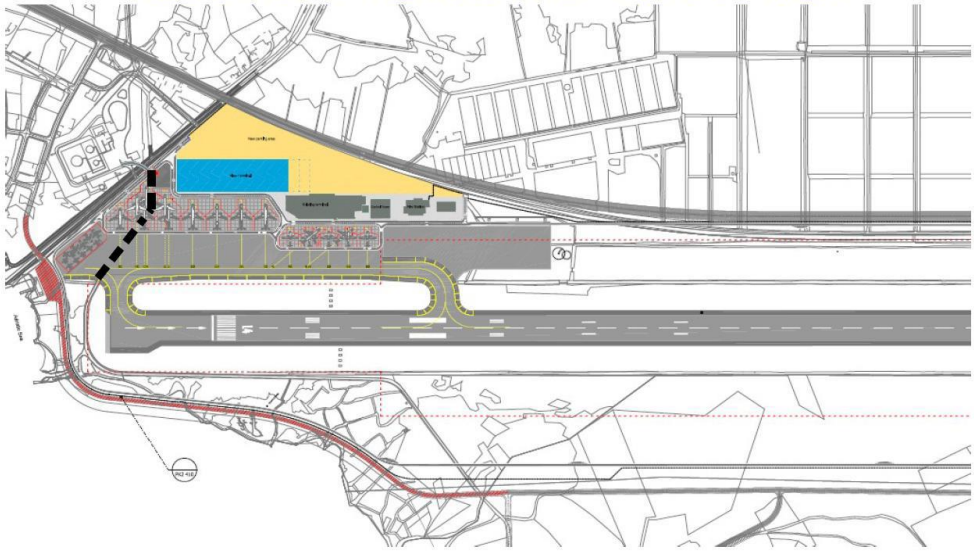
Source: Concept Design document

Figure 6-3: Component 2/A - Apron widening with the new link taxiway service road and utilities (apron details)



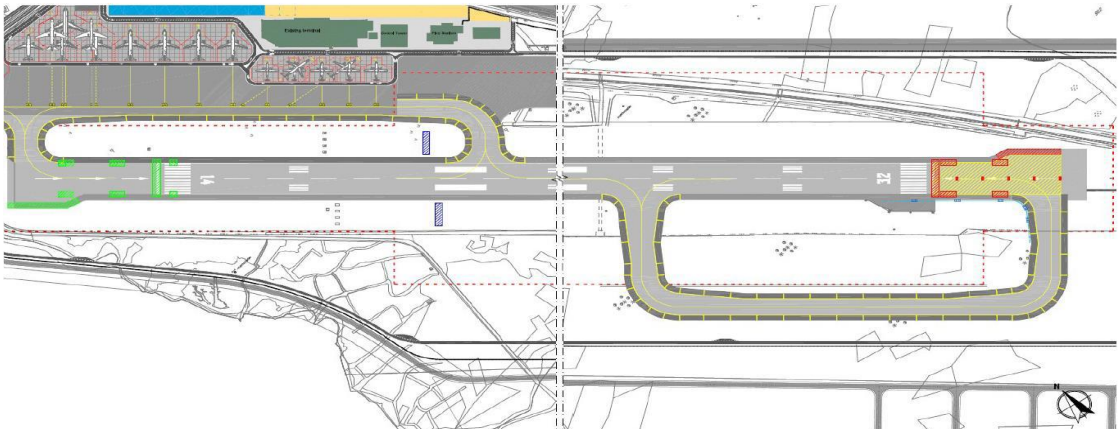
Source: Concept Design document

Figure 6-4: Component 2/B - Relocation of the road Tivat-Ostrvo Cvijeca



Source: Concept Design document

Figure 6-5: Component 3 - Runway 32 started extension and displacement of Runway 14 threshold



Source: Concept Design document

Project implementation

The project is **mature** and in an advanced phase regarding the pre-implementation process. The concept designs document was developed by consultant under EBRD support, according to the schedule illustrated in Table 6-1.

Table 6-1: Development phases of concept design of Tivat airport

Development phase	Time line
Inception Report presentation	October 2015
Stakeholders consultations	November 2015
Presentation of proposed solutions	December 2015
Draft Concept Design presentation	February 2016
Final Concept Design and Draft Concept Design presentations	April 2016
Draft Concept Design	May 2016
Final Concept Design presentations to APM	June 2016
Final Concept Design presentations to stakeholders	June 2016

Source: Concept Design document

For the implementation of the Tivat airport project, the development and approval of the concept designs was an important milestone. The airside concept design has taken into account the inputs received from APM-PIU and the study of MonteCEP and CEP (2013) (and other key documents). Moreover, delivered solutions were the compliance with the international regulations (i.e., ICAO and EASA) as well as the requirements from the other stakeholders (i.e., MCAA and SMATSA[4]).

The development of the Tivat airport control tower has been completed in early 2016 for a total investment of € 4 million. The SMATSA, which controls the airspace of both countries, financed the works.

Transport demand

The Tivat airport has been **one of the fastest growing airports in the region**, doubling the passengers demand volume from 450 thousand in 2006 to 980 thousand in 2016 (i.e., nearly +12% on annual basis).

An important component of transport demand is from the **tourism industry.** In this respect, the air passengers traffic shows a highly seasonal nature, with 80% of the volume handled during the peak season (i.e., June-August) of coastal Montenegro. The capacity of the Tivat airport is deemed insufficient to handle such demand during the peak.

In addition to seasonal traffic, a growing number of general aviation aircrafts uses the airport (i.e., approximately 25% of annual traffic). These aircrafts are space demanding, needing long-term parking areas. They are normally parked for several hours or days (especially during weekends), unlike the commercial traffic, which has a 30-45 minutes turnaround time.

The documents that formed the basis for traffic forecasts of the Tivat airport are (i) the Montenegro Tourism Development Strategy of 2008, (ii) the Review and update of the Airports of Montenegro Master Plan (2010/2011) and (iii) the Analysis of current airport traffic from 2003 until 2010.

The forecasts of passenger demand were developed assuming **three scenarios of growth**, namely low, base and high. In the base scenario, the annual volume of Tivat airport is forecasted to increase from 919 thousand in 2015 to 1,37 million in 2025 and to 1,43 million in 2030 (see Table 6-2). The average annual growth rate ranges from 13,2% (i.e., 2010-2015) to 0,9% (2030-2035). The average annual increase of the whole forecast period is 8,0%.

Table 6-2: Forecasted passenger volume of Tivat airport and Montenegro

Airport	2009	2010	2015	2020	2025	2030
Tivat - Low	532	553	767	977	1.091	1.138
Tivat - Base	532	553	919	1.202	1.372	1.431
Tivat - High	532	553	1.172	1.625	1.699	1.738
Podgorica	n. a.	648	1.136	1.898	2.883	3.220
Total Montenegro	**n. a.**	**1.201**	**2.055**	**3.100**	**4.255**	**4.651**
Share of Tivat airport (base) [%]	n. a.	46	45	39	32	31

Source: Elaboration from MonteCEP and CEP (2013)

According to IBRD (2015), the estimated volume of passengers at the Tivat airport in 2030 is in the interval 1,3-1,6 million. The estimated annual growth factor is assumed in the interval 4,1-7,0% between 2012 and 2030 (see Table 6-3). The volumes and rates depend on the macroeconomic scenarios of development of Montenegro and are in line with the abovementioned forecasts.

Table 6-3: Estimated volumes and annual growth rate

Variable	2012	2030 Low/moderate	2030 Moderate/high
Volume of passengers	725.392	1.254.928	1.639.386

[4] Respectively, Montenegro Civil Aviation Authority and Serbia and Montenegro Air Traffic Services Agency.

Variable	2012	2030 Low/moderate	2030 Moderate/high
Annual growth rate [%]	-	4,1	7,0

Source: Elaboration from IBRD (2015)

As regards the annual volume of air cargo, this is very low and in the range 50-200 tonnes. Aircrafts transporting tourists are not used also for cargo purposes, then cargo transportation should be expected infrequent and on *ad hoc* flights.

Financial analysis

The **financial profitability** analysis was based on demand projections and investment and maintenance costs estimations. The evaluation period extended for 10 years and assumed a residual value of the investment equal to € 10,1 million. Table 6-4 shows the assumed operating period of the airport's assets.

Table 6-4: Assumed operational life of the assets of Tivat airport

Asset	Operating period [years]
Runways	20
Runway accompanying facilities	20
Passenger terminals	20
Facilities for cargo and complementary traffic	15
Air navigation systems	10
Roads	20
Airport infrastructure	20
Commercial facilities	20

Source: MonteCEP and CEP (2013)

Revenues consist of two main categories, namely aeronautical (i.e., operating) and non-aeronautical (i.e., commercial).

Within the operating revenues, the largest share comes from passenger services (i.e., 47%), then from the revenues of handling services (i.e., about 20%) and finally from landing services (i.e., on average 15%). The commercial revenues of the Tivat airport in 2010 and 2011 generated approximately 15-17% of the total income[5].

According to MonteCEP and CEP (2013), **the FIRR is equal to 8,99% and the FNPV equal to € 4,67 million**, with an estimated payback period of 8 years. Information is not available from the documents regarding sensitivity and risks analyses carried out. And information is not available about the financial sustainability analysis.

The funding mechanism foresees that the public entity of Airports of Montenegro could provide 50% of the investment costs. Financial resources in form of loans are estimated for € 26,9 million.

The EBRD is considering financing the construction and expansion of the passenger terminal, the extension of the manoeuvring area and the rehabilitation and extension of the runway to achieve compliance with ICAO safety standards.

Economic analysis

Limited information is available for the economic analysis. According to consulted stakeholder, **the ENPV of the project is equal to € 455 million**[6]. The economic performance has been calculated over a

[5] According to international standards, these revenues usually generate 20-50% of the total income.

[6] In prices of 2015.

fifteen-year period (i.e., 2015-2030) and assuming a discount rate equal to 4%. The benefit-cost ratio is equal to 4,61.

Information is not available with respect to the methodology and assumptions developed to elaborate the economic analysis. There is no indication about sensitivity and risk analyses carried out.

Environmental analysis

The project has no influence on Natura 2000 sites and the analysis of environment impacts (i.e., noise and air pollution study) has been addressed according to ICAO and EASA regulatory requirements.

Notably, the environmental issue concerns **noise**, in relation with the length of the runway. The project is expected to reduce noise impact by building a rapid taxiway (and thus reducing air pollution) by directing the aircrafts as quickly as possible to the final stand.

During August 2012, a **public hearing** was held on the draft plan and the strategic EIA. On the basis of comments of the users and the relevant institutions, a report on the public hearing (which is an integral part of the study MonteCEP and CEP (2013)[7]) has been prepared, based on which the current airport development proposal has been made.

Environmental protection measures have been identified in accordance with prepositions of the Law on Strategic Environmental Impact Assessment (as per Official Gazette of Montenegro, no. 80/05).

Safety levels

The project is expected to **improve safety standards** and achieve compliance with the relevant ICAO recommendations in two important safety risk areas.

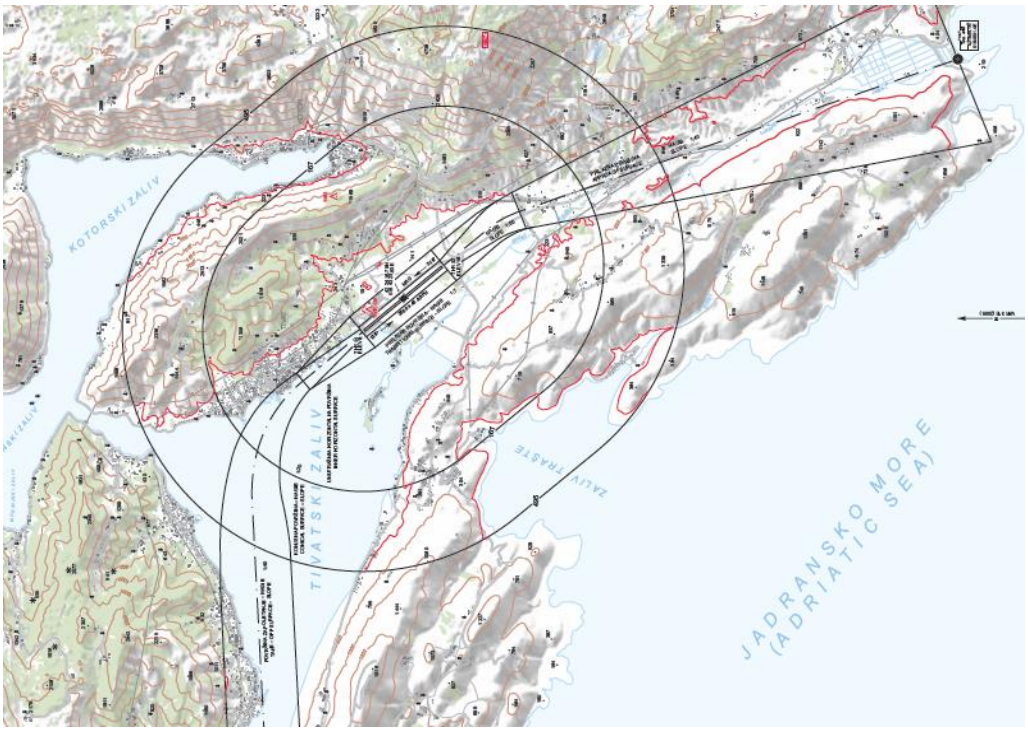
One of the most relevant safety risk is due to the **distance between the existing road and Runway 14**. According to ICAO standards, the road may not be located where it is at present. The project will solve this safety risk by reallocation of the road. In addition, the new control tower can provide a good visual contact with all aircrafts and other vehicles at and around the airport.

Another safety issue regards the **topographical features** of the Tivat airport location and its wider surrounding area: it is not possible to establish an obstacle-free space in these planes. The relief of the terrain penetrates into a large part of the inner horizontal surface and the conical surface, resulting in a limited possibility for flying in the space above the airport. In accordance with the position of the runway in relation to the surrounding terrain and the procedures for landing, the approach and departure planes are located in a space with minimum natural obstacles, which results in a curved shape of these planes.

Figure 6-6 displays the safeguarding surfaces of the Tivat airport (i.e., lines marked in red).

[7] See Section 12 of MonteCEP and CEP (2013).

Figure 6-6: Safeguarding surfaces of the Tivat airport



Source: AIP Montenegro