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Continuities and Discontinuities in Modernisation of Yugoslav Air Transport 1927–1992

Infrastructures and Path Dependence in Air Transport

Path dependence is somewhat difficult to define. In its simplest form, it can be defined as the influence of decisions, events, and processes from the past on the present. James Mahoney provides three criteria that further define path-dependent analyses. Firstly, a path-dependent analysis requires studying causal processes highly sensitive to events taking place in the early stages of a historical sequence. Secondly, those early events are contingent and cannot be explained based on prior events or conditions. Finally, once processes are set into motion, they stay on a certain path which is deterministic.¹

The Cambridge Dictionary defines infrastructure as *the basic structure of an organization or system which is necessary for its operation, especially public water, energy, and systems for communication and transport*.² The Merriam-Webster Dictionary defines it as *the system of public works of a country, state, or region; the resources (such as personnel, buildings or equipment required for an activity); the underlying foundation or basic framework (as of a system or organization)*.³ In his work, Dirk van Laak offers several other views on what can be defined as infrastructure. In the broadest possible sense, it can be described as “everything that enables societal activities of any kind”. A narrower definition of infrastructure calls it “an ensemble of tangible institutions designed for the anonymous population at large and around which an everyday practice has established itself”. He also points out that infrastructures today “consist of large-scale technical systems that the population uses routinely, quasi naturally”.⁴

Based on these definitions, we can say that infrastructure in civil aviation is comprised of four major components. These are aviation law, airports and navigation aids, the aircraft, and personnel of many different profiles (air crew, ground technicians, air traffic controllers). All of them must be closely interconnected

¹ James Mahoney, “Path Dependence in Historical Sociology”, *Theory and Society* 29:4 (2000), <https://www.jstor.org/stable/3108585>.

² <https://dictionary.cambridge.org/dictionary/english/infrastructure>, accessed on Sept. 11th, 2022.

³ <https://www.merriam-webster.com/dictionary/infrastructure>, accessed on Sept. 11th, 2022.

⁴ Dirk van Laak, “Infrastructures”, *Docupedia-Zeitgeschichte*, 20.05.2021; (http://docupedia.de/zg/Laak_infrastructures_v1_en_2021, accessed on November 11th, 2022).

for the entire system to function properly and require constant modernisation so that civil aviation (air transport being an integral part of it) can remain profitable and safe. In most cases, this process requires guidance and support from the state.

The Yugoslav case is no different than that in the rest of the world. Air transport appeared in the Yugoslav state at the same time as it did in other European countries. Indeed, the Second World War changed the political and economic system of the country, but aviation was already at such a degree of development before the war that post-war authorities could begin rebuilding civil aviation by borrowing from pre-war experiences and expertise. These were used as a foundation for further development of the aforementioned components of aviation infrastructure, as this paper will attempt to show. We will also see whether the modernisation of Yugoslav air transport fits the concept of path dependence and, if so, in what way.

The Air Carriers of Yugoslavia

The history of the Yugoslav state coincides greatly with the history of air transport. The first air mail flights on Yugoslav territory were conducted in 1919 and the French-Romanian company CFRNA (later known as CIDNA) included Belgrade in its Paris – Istanbul line in 1923. The first civil aviation company in the Kingdom of Serbs, Croats, and Slovenes, Aeroput, was founded in 1927 and began operating the Belgrade – Zagreb line the next year. This privately owned joint-stock company was given the right to operate Yugoslav domestic and international air traffic for ten years in exchange for state subsidies. This arrangement was extended for another ten years in 1939. Aeroput operated a network of routes connecting major Yugoslav cities along with several European destinations: Vienna, Thessaloniki, Sofia, Prague, Bucharest, Venice, and Milan. Its work was cut short by Yugoslavia's entry into the Second World War and the subsequent occupation of the country. The company was liquidated in 1943, but this decision was overturned in 1945 and it officially reopened, although it did not resume operation as an airline. It was finally liquidated in December 1948.⁵

Air transport in Yugoslavia was resumed in November 1945 by the Yugoslav Air Force, when a Yugoslav airplane flew from Belgrade to Prague. This

⁵ Сава Микић, *Историја југословенског ваздухопловства* (Београд: издање аутора, 1932), 630-641; Radmio P. Givkovitch, *L'aéronautique Yougoslave* (Belgrade: L'Aéro-club Royale de Yougoslavie, 1935), 71-76; Чедомир Јанић, Јово Симишић, *Више од летења: осам деценија Аеропута и ЈАТ-а* (Београд: Јат Airways, 2007), 22-47; Чедомир Јанић, Огњан Петровић, *Кратка историја ваздухопловства у Србији* (Београд: Аерокомуникације, 2011), 24-31; Bojan Dimitrijević, Milan Micevski, Predrag Miladinović, *Kraljevsko vazduhoplovstvo: vojno vazduhoplovstvo Kraljevine SHS/Jugoslavije 1918-1944* (Beograd: Institut za savremenu istoriju, 2012), passim; Čedomir Krunic, *Civilno vazduhoplovstvo Kraljevine Jugoslavije I-II* (Beograd: izdanje autora, 2010), 2013.

was the only institution capable of such an undertaking at the time. It continued operating throughout 1946, connecting Belgrade with Zagreb, Ljubljana, Sarajevo, Titograd, Skopje, Zadar, Prague, and Tirana. This was only a temporary measure until the formation of a proper civil aviation company.⁶

In 1947, two such companies were founded: the Yugoslav-Soviet Civil Aviation Company (Jugoslovensko-sovjetsko akcionarsko društvo za civilno vazduhoplovstvo, YUSTA) and Yugoslav Airlines (Jugoslovenski Aerotransport, JAT). YUSTA was owned jointly by Yugoslavia and the Soviet Union, while JAT was completely owned by the Yugoslav state. After the Tito-Stalin split of 1948, YUSTA ceased operation and was closed in late 1949. JAT remained the Yugoslav flag carrier in the decades to come and had become one of the largest airlines in Europe by the late 1980s, operating a network that connected major Yugoslav cities and tourist destinations with Europe, the Mediterranean, North America, Asia, and Australia, and transporting more than four million passengers per year. Its further development was cut short by the disintegration of Yugoslavia, although it continued work as JAT until 2003, when it was renamed Jat Airways. In 2013, it changed its name again to Air Serbia, thus eliminating the last traces of its old name.⁷

Other airlines were formed in Yugoslavia during the 1960s. The first one, Adria Airways (Adria Aviopromet), was founded by the Government of Slovenia in 1961 as a charter operator, meant to cater to the needs of expanding Yugoslav tourism. Running into financial difficulties by the end of the decade, it was merged with Interexport (Inex), a foreign trade company from Belgrade, and worked under the name Inex-Adria Airways. In 1986, it was separated from Interexport and became known as Adria Airways again. It became the national airline of Slovenia after the country achieved independence. Adria was forced to terminate its services in 2019 due to bankruptcy.⁸

Another civil aviation company was founded in 1961: the Zagreb-based Pan Adria. It was founded by the City of Zagreb and the local aeroclub, and provided agricultural, air taxi, and night postal services, even becoming a member of the Yugoslav Community of Posts, Telephones, and Telegraphs (Jugoslovenska zajednica pošta, telegrafa i telefona). It ventured into the charter business, but also started operating regular lines to smaller Yugoslav airports in agreement with JAT. Operating a small fleet of second-hand aircraft, it ceased operation in October 1976 due to financial problems, only to be replaced by Trans Adria in

⁶ Пија Кукобат, “Поџеси ваздушног саобраћаја у послератној Југославији 1945-1947“, *Istorija 20. veka* 2 (2020), 173-186.

⁷ *Priča o Jugoslovenskom Aerotransportu* (Београд: ЈАТ, 1987); Чедомир Крунић, “Југословенско-совјетско кационарско друштво за цивилно ваздухопловство ЈУСТА“, *Лет*, 2 (2000), 127-151; Јанић, *Кратка историја ваздухопловства у Србији*, 78-85; Milan Gulić, Momir Ninković, “Мјеšovита југословенско-совјетска друштва. Случај JUSTE“, *Istorija 20. veka* 1 (2014), 143-163; Илија Кукобат, *Совјетски утицаји на југословенско ваздухопловство 1944-1949: између сарадње и супротстављања* (Београд: Институт за савремену историју, 2020), 119-134, 198-204; Jovo Simišić, *Bio jedan JAT* (Београд: Lighthouse Studio, 2022).

⁸ Јанић, *Више од летења*, 72.

1978. This was not able to operate successfully either, and was finally merged with JAT in 1982.⁹

Finally, Aviogenex, part of the Generalexport (Genex) foreign trade company, was founded in 1968. Genex operated Yugotours, a tourist agency working in several Western European and Scandinavian countries. Realising that JAT and Adria didn't have the capacity to meet its demands for charter flights, Genex decided to set up an airline of its own. By the end of the 1980s, it was transporting around half a million passengers per year. Aviogenex officially still exists today (2022) and owns a single airplane, but its actual status is unknown.¹⁰

Regulating Civil Aviation

Civil aviation requires a set of rules, just as do all human activities. These rules are set at two levels, international and national. International conventions, such as the Paris Convention of 1919 and the Chicago Convention of 1944, establish general rules regarding state sovereignty over airspace, aircraft registration, and safety.¹¹ They also ensure that national laws are similar to each other and in line with international law. The Warsaw Convention of 1929 (amended in 1955 and 1971) and Montreal Convention of 1999 regulate documents of carriage (passenger tickets and goods lists) and liability of an air carrier in case of an accident. National laws on air navigation are written in line with the political and economic systems of a particular country, as well as the state of development of its civil aviation. Finally, bilateral agreements on air transport regulate commercial air navigation between the signatories. They are comprised of two parts. The first part is based on international conventions regulating civil aviation, while the second part, usually in the form of an annex, details the routes to be operated by designated air carriers.¹²

The Kingdom of Serbia was one of the first countries in the world to regulate air navigation by passing the Statute on Machines that Travel by Air (serb. *Uredba o spravama koje se kreću po vazduhu*) in 1913.¹³ The first Yugoslav Law on Air Navigation (serb. *Zakon o vazdušnoj plovidbi*) was passed in 1927. This was the basic legal act regulating civil aviation in the country, and air transport as well. It contained provisions regarding the registration of aircraft, crew documents, the use of airports, the general rules of air navigation, and air

⁹ Јанић, *Више од летења*, 72, Zlatko Kurjaković, *Pan Adria JPPT. Hrvatski Ikar* (Zagreb: Biakova, 2020).

¹⁰ Ivan Gorjup, *Aviogenex* (Beograd: izdanje autora, 1987); Јанић, *Више од летења*, 89; Јанић, *Кратка историја ваздухопловства у Србију*, 82.

¹¹ Suggested reading: Alan Dobson, *A History of International Civil Aviation: From its Origins through Transformative Evolution* (London – New York: Routledge, 2019).

¹² Bogoljub Filipović, *Odnos vazduhoplovnog prava SFRJ i međunarodnog vazduhoplovnog prava* (Beograd: Savez udruženja pravnika Jugoslavije, 1979), 16-30; *Uprava civilnog vazduhoplovstva: godišnji bilten 1* (1955), 14-16.

¹³ Krunić, *Civilno vazduhoplovstvo Kraljevine Jugoslavije II*, 13-15.

transport operations. This was also the basis for other regulation, such as the Rules of International Air Transport (serb. *Pravilnik za međunarodni vazdušni saobraćaj*).¹⁴

In 1945, new Yugoslav authorities declared all laws and decisions passed by occupying forces on Yugoslav soil, as well as their collaborators, to be null and void. This decision was turned into a law in 1946 and extended to all laws passed by the Kingdom of Yugoslavia and its predecessors prior to April 6th, 1941.¹⁵ This meant that the 1928 Law on Air Navigation was also annulled. In 1949, the Yugoslav Government passed the Statute on Air Navigation (serb. *Uredba o vazdušnoj plovidbi*). This was envisaged as a temporary regulation to be replaced by a new law, meaning that all aspects of civil aviation were regulated in a much shorter form. The language of the Statute suggests that it was at least partly based on the 1928 Law. This temporary situation lasted until 1965, when the new Law on Air Navigation was finally passed. It regulated the same matters as its 1928 predecessor, but in greater detail. For the first time, provisions on air traffic control and safety inspection became parts of the basic act on Yugoslav civil aviation.¹⁶

The 1965 Law was already becoming obsolete by the early 1970s due to advances in aviation technology, changes in the Yugoslav economic system, and the appearance of new air carriers in the country. This obsolescence is specifically related to the introduction of organisations of associated labour in Yugoslav law and economics, as well as the need to coordinate the work of several air carriers, some of which operated on the same routes. A new Law on Air navigation was passed in 1973, with new provisions related to aviation safety, crew licences, the use of mixed civil and military airports, and the introduction of arrangements related to timetables on routes operated by more than one air carrier. The next Law was passed in 1978 after a series of accidents proved that further regulation regarding aviation safety was needed. It thus placed even greater emphasis on matters related to the work of air traffic control, breaches of safety procedures, and accident investigations. Another Law on Air Navigation was passed in 1986, retaining most provisions found in its 1978 predecessor. All these laws and other regulations were passed on a federal level, as civil aviation was solely in the jurisdiction of the federal state.¹⁷

¹⁴ *Службене новине Краљевине СХС*, бр. 50, 3. март 1928; Krunić, *Civilno vazduhoplovstvo Kraljevine Jugoslavije II*, 32-60.

¹⁵ Закон о неважности правних прописа донетих пре 6. априла 1941. године и за време непријатељске окупације (Law on the Annulment of Regulations Passed before April 6th, 1941, and during Enemy Occupation), *Службени лист ФНРЈ*, бр. 86, 25. октобар 1946.

¹⁶ *Службени лист ФНРЈ*, бр. 47, 4. јун 1949; *Службени лист СФРЈ*, бр. 12, 24. март 1965.

¹⁷ *Службени лист СФРЈ*, бр. 33, 14. јун 1973; *Службени лист СФРЈ*, бр. 23, 28. април 1978; *Службени лист СФРЈ*, бр. 45, 1. август 1986.

Ground Infrastructure

Airports were at first large fields with small buildings used for the handling of passengers and goods. Gradually, they became larger and grass runways were replaced with ones made of concrete or asphalt. This enabled the use of ever larger aircraft, while the introduction of navigation aids such as radio beacons and instrument landing systems allowed for great increases in aviation safety.¹⁸

The general transport situation in the Kingdom of Yugoslavia can be described as bad. The railway network consisted of several different systems (Serbian, Ottoman, Bosnian, Hungarian, and Austrian) and much time and effort were invested in unifying the functioning of railways. Most roads were not suitable for use by motor vehicles and a great programme of modernization was started only in the late 1930s. In these circumstances, it was considered that air transport, although it could not move the same volume of passengers and goods as trains, ships, or motor vehicles, could be used to connect the major cities of Yugoslavia. Its main advantage over other modes of transport was speed. While traveling by car, train, or ship could sometimes take days, an airplane could get from point A to point B within hours. This was especially true for Bosnia, Dalmatia, and Montenegro.¹⁹

The first airport open for public transport in the Yugoslav state was Belgrade airport, opened near Pančevo in 1923. In 1927, it was transferred to a new location near Zemun. Gradually, new airports were opening across the country, with a total of thirteen being used by Aeroput (though not all of them at the same time). They were mostly built in political and economic centres of the country by Aeroput with support from the army, local aeroclubs, and authorities. Airports in Belgrade, Zagreb, Ljubljana, and Skopje, which had modern buildings and hangars, were open year-round and used for international flights. Others were used only during the flying season, which generally lasted from spring to late autumn. These usually had a small terminal building and a wooden hangar used to house aircraft in cases of bad weather. The international airports were also equipped with radiotelegraphs and radio direction finders, the first communication and navigation aids used in civil aviation. All airports had grass runways, as was the case all around the world at the time.²⁰

¹⁸ David Simons, Thomas Withington, *The History of Flight* (Bath: Parragon, 2006), 111-112; R. G. Grant, *Flight: The Complete History of Aviation* (London: Dorling Kindersley, 2017), 143-145.

¹⁹ Микић, *Историја југословенског ваздухопловства*, 636-638; Мијо Мирковић, *Саобраћајна политика* (Београд: Издавачка књижевница Геце Кона, 1933), 219-238; Мијо Мирковић, *Економска структура Југославије 1918-1941* (Загреб: Накладни завод Хрватске, 1950), 113-138; Branko Petranović, *Istorija Jugoslavije I* (Београд: Nolit, 1988), 79-80; Станислав Краков, *Репортаже из авијације* (Београд: Службени гласник, 2020), 17-18.

²⁰ Č. Krunic, *Civilno vazduhoplovstvo Kraljevine Jugoslavije I*, 29-55; Јанић, *Више од летења*, 35.



Map 1: Airport network within the administrative boundaries of interwar Yugoslavia
Periods of operation are given in brackets (I. Kukobat)



Photo 1: Front view of old Belgrade Airport, early 1930s (L'aéronautique Yougoslave)

Civil air transport was renewed in 1946 connecting Belgrade with the capital cities of Yugoslav republics, as well as Zadar. This provided the fastest connection at a time when other modes of transport were still recovering from the war. By 1954, several airports in major tourist centres had been opened but operated only during the summer season. Due to a lack of other modes of transport, these offered the fastest and most comfortable way to travel around the country, as was the case before the war. This was especially the case in Montenegro and along the Adriatic coast, which had very limited road and rail connections to other parts of Yugoslavia or even no connection at all.²¹



Map 2: Airport network of Yugoslavia in 1954. Seasonal airports are marked with an asterisk. Dubrovnik and Herceg Novi were served by the same airport, with buses taking passengers to their final destination (I. Kukobat)

The general condition of post-war Yugoslav airports was still very poor. By 1954, only Belgrade Airport had a concrete runway 1600 metres long, while all the others had grass runways 1200 metres long. This limited the weights and dimensions of the aircraft that could operate at these places. They were still only equipped with radiotelegraphs and radio direction finders. Starting in the late

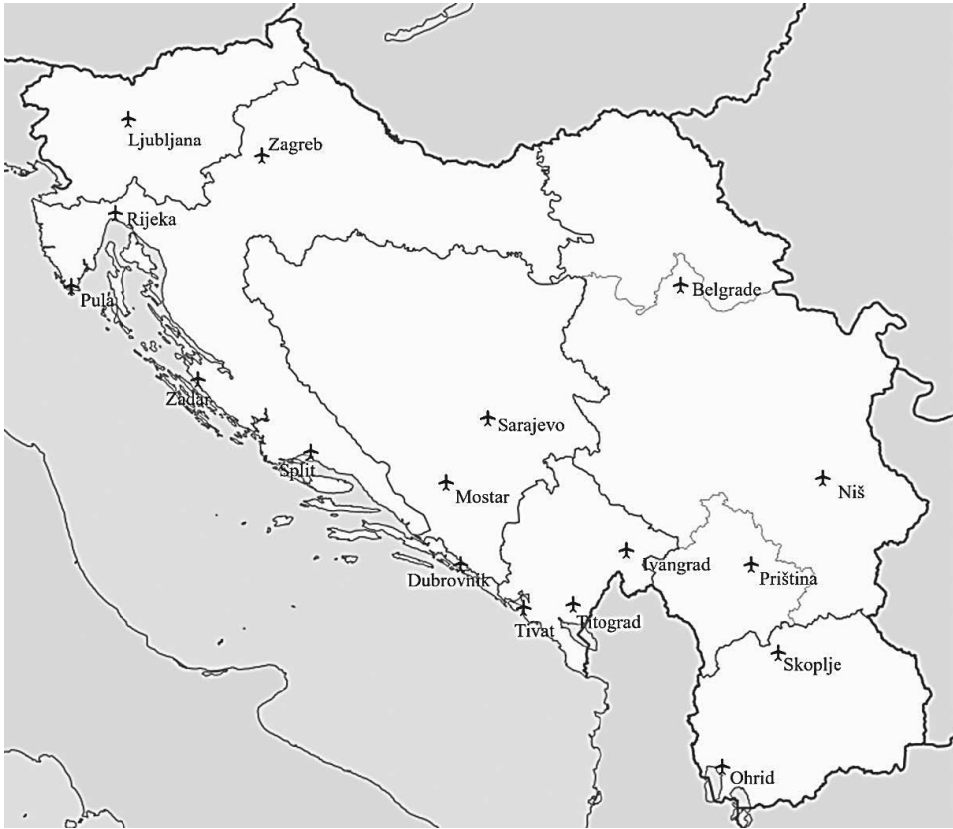
²¹ *Uprava civilnog vazduhoplovstva: godišnji bilten 1 (1955), 7-10, 21f.*

1950s, a great programme of modernisation was initiated, going in three directions. In the first case, completely new airports were built, such as those in Belgrade, Ljubljana, Priština, Rijeka, Split, and Dubrovnik. This was mostly done in cities where existing airports could not be expanded or modernised. On the other hand, existing military airports were modified to serve both the Yugoslav Air Force and civil air transport in Zagreb, Zadar, Pula, Mostar, Titograd, Skopje, and Niš. This greatly decreased construction costs as it was only necessary to build a passenger terminal and a platform for aircraft. Finally, in Sarajevo, Tivat, and Ohrid, existing airports were modernised by building new terminals and concrete runways. These airports could now serve much bigger aircraft, which enabled a great increase in passenger numbers and contributed to the development of tourism in Yugoslavia. Some airports were closed for commercial services after the only aircraft that could operate from them were retired from service (Žabljak was completely closed, while Ivangrad [modern-day Berane] was given to the local aeroclub).²²



Photo 2: Control tower and passenger terminal at new Belgrade Airport around the time of its opening, circa 1962 (Annual Bulletin of the Directorate General of Civil Aviation of Yugoslavia, 1961)

²² *Uprava civilnog vazduhoplovstva: godišnji bilten 1* (1955), 21f.; *Uprava civilnog vazduhoplovstva: godišnji bilten 5* (1958), 6f.; *Uprava civilnog vazduhoplovstva: godišnji bilten 6* (1959); 8-10; *Savezna uprava za civilnu vazdušnu plovidbu: godišnji bilten* (1975), (1976), 31-36, 54-59.



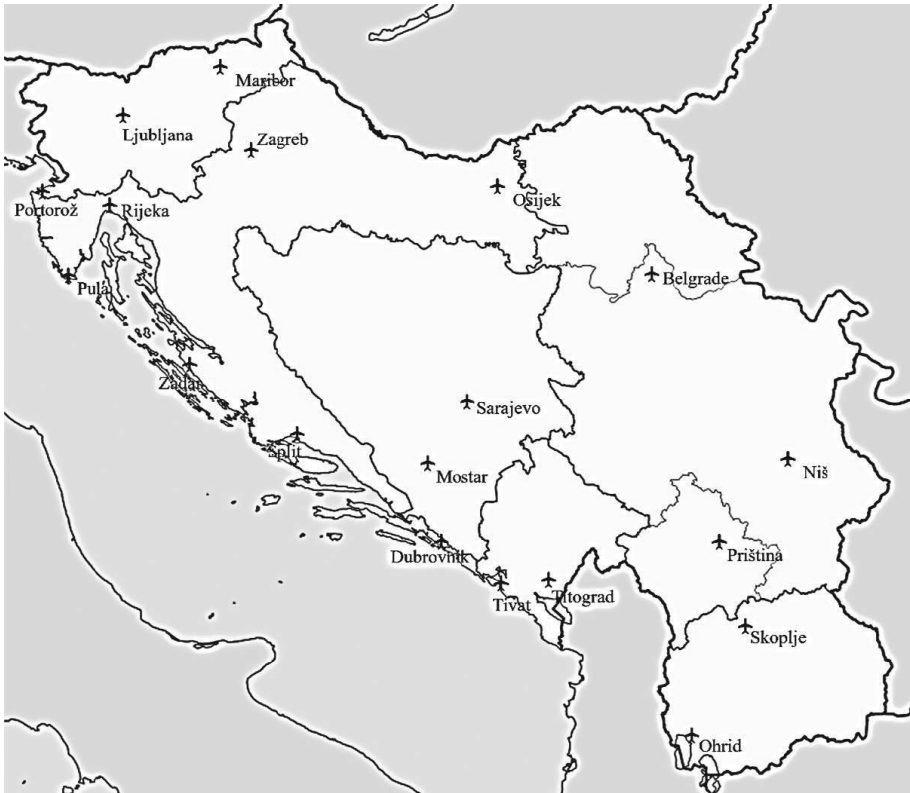
Map 3: Airport network of Yugoslavia in 1975 (I. Kukobat)

Besides the construction and modernization of airports, great attention was given to the modernisation of navigation and communication aids. Radiotel-egraphs were replaced by VHF radio systems both in flight control towers and in aircraft. Airports were equipped with instrument landing systems and radar. Air corridors were marked by radio-beacons, which were also installed on airports. All these measures were partly financed from the federal budget and greatly contributed to aviation safety.²³

After 1975, only two completely new airports were constructed, in Maribor and Osijek. By the end of the 1980s, there were nineteen airports open for commercial flights in Yugoslavia. The twentieth, in Banja Luka, was opened in 1985, with commercial flights only being introduced in 1992. Eight airports (Portorož, Pula, Rijeka, Zadar, Split, Dubrovnik, Tivat, and partly Titograd) were mostly used for flights bringing tourists to the Adriatic coast. Although the road and railroad network were greatly expanded between 1945 and 1992, air travel was still the easiest way to bring both foreign and domestic tourists to the

²³ *Uprava civilnog vazduhoplovstva: godišnji bilten 6 (1959), 7; Службени лист СФРЈ, бр. 8, 19. фебруар 1969.*

Adriatic. The only administrative part of the country without an airport on its territory was Vojvodina, which was served by airports at Belgrade and Osijek and had a good network of roads and railroads.²⁴



Map 4: Airport network of Yugoslavia in 1987 (I. Kukobat)

As for international routes, they represented a combination of political and economic considerations. Prior to the Second World War, *Aeroput* operated few international routes as it was constrained by low government subsidies which were barely sufficient for domestic traffic. It only widened its international network starting in 1937. Postwar, the first international routes were closely related to Yugoslavia's international position, with services to Prague, Warsaw, Budapest, Bucharest, Sofia, and Tirana. Some were closed due to unprofitability in early 1948 (Bucharest and Budapest), while others were closed due to the Tito-Stalin split in 1948. In 1949, JAT opened its first route to Western Europe, the Belgrade – Zagreb – Zürich line, gradually introducing services to Munich, Frankfurt, Vienna, Paris, and London. The 1950s also saw the introduction of routes towards Athens, Istanbul, Cairo, and Beirut. The establishment of these routes can be connected to Yugoslavia's turn towards African and Asian countries in its foreign policy. After Yugoslavia improved its relations with the Eastern

²⁴ Branko Petranović, *Istorija Jugoslavije III* (Beograd: Nolit, 1988), 422; Simić, *Bio jedan JAT*, 195.

Bloc, routes to those countries were slowly reintroduced. For example, JAT only opened the Belgrade – Warsaw – Moscow route in 1965. That same period saw the first charter or non-regular services meant to bring tourists from Western Europe and Scandinavia to the Adriatic coast of Yugoslavia. These services were performed by JAT, Adria, and Aviogenex. During the 1970's, JAT opened a network of routes in Australia and North America aimed at the Yugoslav emigree communities, as well as foreign tourists. These offerings later encompassed China, though the Beijing service was started and cancelled several times. Despite Yugoslavia being one of the leading countries of the Non-aligned movement, services to Africa were limited to Mediterranean countries (Egypt, Libya, Algeria, Tunisia). Flights south of the Sahara only carried exported goods and equipment needed at construction sites operated by Yugoslav companies. It is interesting to note that JAT also leased aircraft carrying pilgrims from Muslim countries to Meccah.²⁵

Personnel

Personnel needed to operate and maintain aircraft are highly diverse. They include air crew (pilots, flight engineers, navigators, and radio operators), cabin crew, mechanics, air traffic controllers, dispatchers, technicians, technical controllers, and others. All of them require proper education and training, as well as regular examinations to maintain their licences.

At first, pilots in air transport were former military aviators who had left the service after the First World War. This was also the case in Yugoslavia. The first three pilots hired by Aeroput were White Russian émigrés who came to the country after their defeat in the Russian Civil War. Later, Aeroput hired more pilots, radio operators, and flight engineers, all of whom had previously served in the Yugoslav Army. There were some exceptions, as at least two pilots had previously worked abroad, one with Air France and the other with Lufthansa.²⁶

During 1945 and 1946, air transport was operated by the Yugoslav Air Force, meaning that aviators and ground personnel were members of the Yugoslav Army. Those needed for work in civil aviation were demobilised and transferred to JAT at the time of its foundation. Some of them were transferred to YUSTA, where they worked together with Soviet personnel. A few of them had worked for Aeroput before the Second World War, but there were also experienced aviators from the pre-war Yugoslav Army and aeroclubs. Their war records are very diverse. Some had spent the war in captivity, others had joined the National

²⁵ For further information refer to: *Uprava civilnog vazduhoplovstva (Direkcija za civilnu vazdušnu plovību, Savezna uprava za civilnu vazdušnu plovību): godišnji bilten (Directorate General of Civil Aviation: Annual Bulletin)*, (1955-1977); *Priča o Jugoslovenskom aerotransportu, passim*; Јанић, *Више од метења*, passim; Krunić, *Civilno vazduhoplovstvo Kraljevine Jugoslavije I*, 270-384; Simišić, *Bio jedan JAT*, passim.

²⁶ Чедомир Јанић, Огњан Петровић, *Творци ваздухопловства Краљевине Југославије* (Београд: Музеј науке и технике, 2017), 202-204, 221-223; Krunić, *Civilno vazduhoplovstvo Kraljevine Jugoslavije I*, 240f.

Liberation Army of Yugoslavia and had flown in its aviation units during 1944 and 1945. Some of them were previously members of the Air Force of the Independent State of Croatia who joined the Partisans late in the war. As available records show, the last of the Aeroput aviators only retired from JAT around 1971.²⁷

During the 1950s and 1960s, all new personnel in air transport came from the Yugoslav Air Force and the Aeronautical Union of Yugoslavia. Military pilots were trained at the Air Force Academy (*Vazduhoplovna vojna akademija*) or the Pilots School for Non-commissioned Officers (*Pilotska podoficirska škola*), while sports pilots were trained at local aeroclubs or the Federal Pilots School (*Savezna pilotska škola*), which was later transformed into the Federal Aviation Centre (*Savezni vazduhoplovni centar*). After transferring to JAT, some of them flew agricultural aircraft before being transferred to air transport. While their numbers were satisfactory at the time, problems started to arise with the quality of their training. Military and sports pilots were not trained to fly in the same way and the ways of thinking and habits they had brought with them were not compatible with air transport. This is especially true for military pilots, some of whom tended to be overconfident, which led to several tragic accidents in 1950-1951 and 1955-1956.²⁸

In the 1960s, it was also realised that the growing demand for pilots expected in the years to follow could not be met in the old way. Finally, the Yugoslav Air Force was becoming unsatisfied with the fact that many of its pilots wanted to leave military service and it was looking for a way to prevent them from doing so. Thus, Yugoslav experts decided to observe foreign experiences on the matter, especially the training centres of American air carriers Pan American Airways and United Airlines. They accepted trainees with little to no prior flying experience, meaning those learners would be trained to fly commercial aircraft from the very start. He recommended the adoption of the same system by JAT. At the same time, the Aeronautical Union of Yugoslavia operated its Federal Aviation Centre in Vršac, meaning that there already was an airport with flying instructors and aircraft that JAT could use instead of building a training centre from scratch. In 1972, it this centre was merged with JAT's Training Centre, thus creating the Pilot School. Other air carriers followed. Inex-Adria opened its own training centre in cooperation with the local aeroclub in Ljubljana, while Pan Adria took part in forming Higher Aviation School (*Viša zrakoplovna škola*) in Zagreb. Aviogenex only started training its own pilots in 1992. Each of the air carriers trained cabin crews on its own, while air traffic controllers were trained by the state institution responsible for the service. Technicians and mechanics were educated in technical schools and faculties, both civilian and military.²⁹

²⁷ Kukobat, Počeci vazdušnog saobraćaja, 182; Simišić, *Bio jedan JAT*, 13-15.

²⁸ For more details on these accidents refer to: *Управа цивилног ваздухопловства: специјални билтен – удеси у цивилном ваздухопловству од 1949. до 1958*, 3 (1959).

²⁹ *Priča o Jugoslovenskom Aerotransportu*, 150-151; Јанић, *Више од летања*, 88, 102; Георгије Нинчић, *Мој живот* (Београд: издање аутора, 2011), 174-181, 185-195, 200-225; Simišić, *Bio jedan JAT*, 86-90, 145-146.

Starting from the 1950s, several Yugoslav experts were sent abroad for training as part of international technical assistance programmes. These were mostly engineers, air traffic controllers, and legal experts who were introduced to the functioning of airports, air carriers, and state institutions regulating civil aviation. Their job was to learn procedures and transfer them to Yugoslavia. Besides this, foreign flying instructors were sent to Yugoslavia to perform examinations of domestic airline pilots, thus helping to achieve a considerable increase in aviation safety. Later, Yugoslav training facilities were used to train future airline pilots from Nonaligned countries.³⁰

Airplanes

Machines operated in air transport have come a long way since they first appeared right after the First World War. At first, these were bombers and reconnaissance aircraft modified by installing a few passenger seats. Gradually, these were replaced by bigger, faster, and safer machines. By the time the Second World War began, passenger aircraft were made of metal and equipped with the instruments needed for flying at night and in bad weather. After the war, new, four-engined planes were flying across the oceans, making the world ever smaller. These piston-engined machines were soon replaced by jets capable of traversing huge distances without landings along their routes. Further improvements came in the shape of increased automation and better fuel economy.³¹

Obtaining passenger planes for Yugoslav air carriers was not only a matter for the carriers themselves, but also for the state. It was closely related to the ability of airports to handle those aircraft, the purchasing power, as well as the international position of the country. At the time of its founding, Aeroput was given permission to import its first six Potez 29 planes from France. Others were to be purchased from domestic manufacturers. On several occasions, Yugoslav manufacturers demanded that they produce aircraft for Aeroput, but only a single Spartan Cruiser was produced by Zmaj in 1935 under British licence. The main reason for this was the fact that Aeroput did not need such a quantity of airplanes that would make domestic production profitable. Thus, Aeroput operated several types of French, British, and American aircraft. The most numerous of them was the American Lockheed Electra, with seven being purchased from 1937 to 1939.³²

³⁰ Reffer to: *Uprava civilnog vazduhoplovstva: godišnji bilten 1-8 (1955-1962)*.

³¹ D. P. Davies, *Handling the Big Jets* (London: Civil Aviation Authority, 1985), 17-21; Simons, *The History of Flight*, 87-108, 155-183; Grant, *Flight*, 106-165, 374-401.

³² Krunić, *Civilno vazduhoplovstvo Kraljevine Jugoslavije I*, 204-229; Ognjan Petrović, Đorđe Nikolić, *Yugoslav Electras: From Aeroput Airlines to RAF* (Stockholm: Canfora Publishing, 2022), 26-61.



Photo 3: A Potez 29 operated by Aeroput (Photo courtesy of Bojan Dimitrijević)

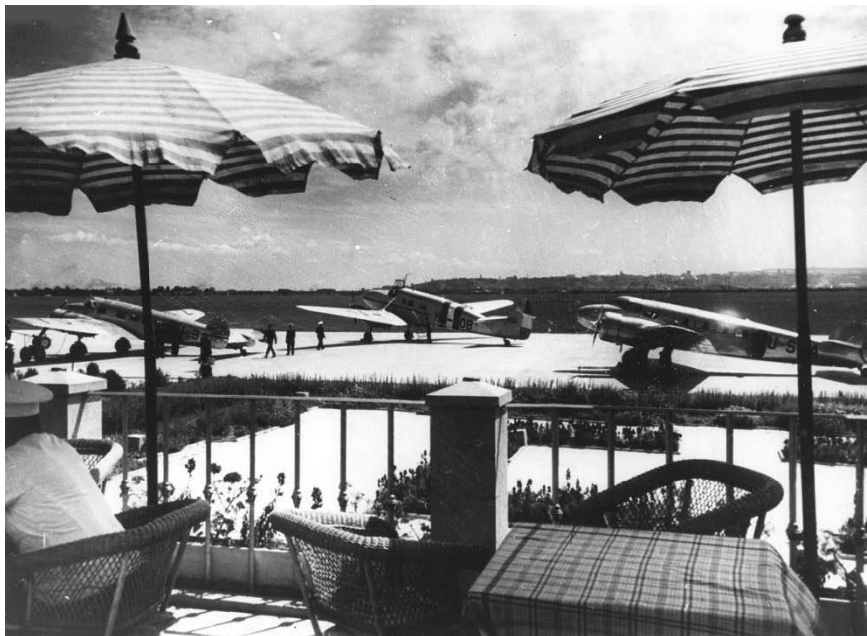


Photo 4: A view of the platform at Belgrade Airport, 1940: two Lockheed Electras of Aeroput (left and right) and a Hungarian Focke Wulf Fw 58 (in the centre)
(Photo courtesy of Bojan Dimitrijević)

At the time of the renewal of air transport after the Second World War, experts suggested that the best choice of aircraft for Yugoslav needs would be the American Douglas DC-3 or the German Junkers Ju 52. Both were readily available from war surpluses and as war trophies. These were exactly the types of aircraft that were operated at first by the Yugoslav Air Force, along with the Lisunov Li-2, and remained in use with JAT and YUSTA. Later, the expansion of JAT's international and domestic services brought the use of more modern, larger, and better equipped aircraft: the Convair CV-340 and CV-440, the Ilyushin Il-14M, and the Douglas DC-6B. Each purchase was subject to a detailed analysis by technical and economic experts who would produce a document recommending the obtaining of a certain type of aircraft based on their performance, capacity, operational costs, cost per unit etc.³³



Photo 5: JAT aircraft at old Belgrade Airport, between 1957 and 1962. In the centre are three Convairs (YU-ADB, YU-ADD and YU-ADK), to the left and right are three DC-3s and in the background is an Il-14, next to which are three agricultural aircraft (Photo courtesy of Predrag Miladinović)

The introduction of jet aircraft did not go unnoticed in Yugoslavia. By 1961, it was realised that piston-engined aircraft were becoming obsolete and that JAT needed a completely new type of airplane to stay competitive on the international market. As new airports were being constructed around the country, larger types of aircraft could be introduced into service. A report prepared by the

³³ *Priča o Jugoslovenskom Aerotransportu*, 36-63; Јанић, *Више од летења*, 50-73. Examples of such documents can be found at: Archives of Yugoslavia (AJ), fund 130 (Savezno izvršno veće), box 729, dossier 1185 (130-729-1185), Tehnička analiza kupovine aviona za potrebe preduzeća Jugoslovenski aerotransport, December 8th, 1955; AJ 599-273, Dopune uz investicioni program za nabavku aviona Il-14M sa pripadajućom opremom i rezervnim delovima, July 1957.

Federal Secretariat for Transport and Communications provided a comparison of four types of aircraft: the French Sud Aviation SE.210 Caravelle, the Soviet Ilyushin Il-18, the British de Havilland DH.121 Trident, and the American Boeing 727.³⁴

Table 1: Comparison of medium range aircraft available in 1961³⁵

No.	Type of aircraft	Caravelle	Il-18	DH.121	B-727
1.	Country of origin	France	USSR	UK	USA
2.	Type of propulsion	Jet	Turboprop	Jet	Jet
3.	Number of engines	2	4	3	3
4.	Engine lifetime between overhauls, hours	1.800	500 (200 in reality)	1.600	1.600
5.	Cruise speed, km/h	815	625	850	910
6.	Number of seats	80	110	100	94
7.	Operational costs per 1 km flown over a route of 800 km, 1961 Yugoslav dinars	770	2.340	855	970
8.	Price, 1961 \$	3.230.000	2.200.000	3.650.000	4.375.000

The final decision was to obtain the Caravelle for two major reasons. The Trident and B-727 were still in development, while the Caravelle was already in service. This meant that crews could be trained, and aircraft maintained with an air carrier that already used the same type of aircraft, and that experiences gathered by other carriers operating the Caravelle could be used by JAT. It was far superior to the Il-18 by nearly all parameters. The Caravelle was introduced to regular service in 1963 and used until the end of 1976.³⁶



Photo 6: Caravelle YU-AHB owned by JAT
(Photo courtesy of Predrag Miladinović)

³⁴ AJ-837 (Kabinet Predsednika Republike), file III-a-4-c, box 52, Informacija Sekretarijata SIV-a o nabavci aviona, September 24th, 1961.

³⁵ Ibid.

³⁶ AJ-837, III-a-4-c, box 52, Informacija Sekretarijata SIV-a o nabavci aviona, September 24th, 1961; *Priča o Jugoslovenskom Aerotransportu*, 66-68; Јанић, *Више од летења*, 76, 82f.; Simišić, *Bio jedan JAT*, 109.

Charter air carriers tended to operate second-hand aircraft. These were readily available, they could still bring a profit, and their spare parts could still be procured. This was the case for Adria, which began operations with four DC-6s bought from the Netherlands, and Pan Adria, which bought CV-440s from West Germany.³⁷

As newer types of aircraft appeared during the 1960s, JAT was already looking for a replacement for the Caravelle. The same went for Adria and Pan Adria, which also wanted to modernise their fleets. Because they already operated a mixture of several aircraft types, the government decided to intervene. Although JAT wanted to procure the Boeing 737-200, it was forced by the federal authorities to buy the Douglas DC-9-32, which Adria had already decided on. Douglas was willing to give better payment conditions, meaning that the planes were to be paid for by exports of Yugoslav goods to the U.S.A. Thus, the DC-9 became the basic type of aircraft in Yugoslav air transport. On the other hand, Aviogenex went its own way and obtained the Soviet Tupolev Tu-134 as payment for Yugoslav goods exported to the Soviet Union. As passenger numbers rose above expectations, JAT also bought the American Boeing 727-200, which was larger and had a greater range than the DC-9.³⁸



Photo 7: DC-9 YU-AHJ owned by Inex-Adria
(Photo courtesy of Predrag Miladinović)

³⁷ Јанић, *Више од летења*, 72.

³⁸ Document “Izbor novog tipa aviona za saobraćaj u evropsko-mediteranskoj oblasti (skraćeni investicioni elaborat)”, circa 1967, owned by the author; AJ-837, III-a-4-c, b. 52, Neka pitanja u politici nabavke saobraćajnih aviona, January 22nd 1969; Gođur, *Aviogenex* 4f.; Јанић, *Више од летења*, 89; Simišić, *Bio jedan JAT*, 127-129.



Photo 8: Tu-134A YU-AHY owned by AvioGenex. On the right is the nose of a DC-6, probably owned by Inex-Adria (Photo courtesy of Predrag Miladinović)

During the 1970s, JAT introduced long range routes to Australia and North America to cater to the needs of Yugoslav émigré communities there. At first it obtained second-hand Boeing 707 jets with the idea that an older but still reliable type of aircraft should be used to develop the network of routes, while more modern aircraft should be bought later. In 1977, JAT decided to buy the Boeing 747SP, a version of the famous Jumbo Jet, with a smaller capacity and an increased range compared to the basic model. Again, the state intervened for the same reason as before, meaning that JAT had to buy the McDonnell-Douglas DC-10-30. This aircraft became a symbol of JAT during the 1980s.³⁹

The modernisation of the civil aviation fleet continued throughout the 1980s. JAT and Adria were fully aware that the DC-9 and B-727 were slowly becoming obsolete and unprofitable, and that replacing them was necessary. While Adria decided to buy the MD-80, a longer version of the DC-9, and the Airbus A-320, JAT managed to obtain the Boeing 737-300, becoming the first European operator of this version. In 1987, JAT decided to introduce smaller, turboprop aircraft for regional and domestic routes, choosing the French-Italian ATR-42 and ATR-72. As a replacement for the DC-10, it decided to buy the McDonnell-Douglas MD-11, but the purchase did not materialise. AvioGenex finally gave up on Soviet aircraft during the same period and transitioned to the

³⁹ "Boeing 747-SP u floti JAT", *Jugoslovenski aerotransport* (4/1977), 5; "DC-10 u floti JAT", *Jugoslovenski aerotransport* (6/1977), 1, 3; Ilija Kukobat, "Development of Air Transport between Yugoslavia and the United States of America 1945-1992", *Istorija 20. veka*, 2 (2022), 450, 454; Simišić, *Bio jedan JAT*, 132, 180.

Boeing 727-200 and 737-200, which were more economical (lower operating costs and fuel consumption) and more compatible with its services oriented towards Western Europe.⁴⁰



Photo 9: Line-up of aircraft operated by JAT in 1991. From the front: ATR-72, DC-9, B-737, B-727, DC-10 (Photo courtesy of Predrag Miladinović)

Conclusion

Air transport in Yugoslavia was developed according to the country's needs, while at the same time following world trends. Processes in its modernisation that were set in motion before the Second World War continued in the post-war period despite great changes in the country's political and economic system. The processes were influenced by several constants. The first one was geography, which greatly influenced the layout of the country's airport network. This also includes an almost constant lack of proper communications between certain parts of the country, meaning that air transport was at times the easiest, fastest, and most comfortable way to travel. The second one was the involvement of the state in ways other than just regulation. This influence at different times manifested itself in investments in equipment or in direct influence over decisions such as aircraft purchases. The third one was tradition. Interwar Yugoslav aviation had achieved a certain degree of development, meaning that post-war authorities did not have to build civil aviation completely from scratch, but rather was able to use pre-war expertise and experience. The fourth one was the realisation, shared by all relevant institutions, that civil aviation was in a state of constant change, and that failing to meet international standards and lagging behind the rest of the world could have had grave consequences for Yugoslav air transport along with tourism and the economy in general. These constants can be treated as path

⁴⁰ Gorjup, *Aviogenex*, 107, 114-115, 136; Јанић, *Више од летења*, 72, 89, 119, 121, 126; Simišić, *Bio jedan JAT*, 211, 220f., 228, 235, 238.

dependencies, as they were present from the appearance of air transport in Yugoslavia, were not connected to each other prior to the existence of the country and civil aviation and were present throughout the entire period observed in this paper. These four constants then influenced certain continuities and discontinuities in the four infrastructural components of air transport. Continuities can be observed in regulation (new laws were passed due to advances in technology, safety, procedures, and the country's economic system), the development of ground infrastructure (airports were modernised to accommodate more modern aircraft and larger volumes of traffic, and navigation aids were introduced to increase safety) and aircraft purchases (the constant orientation towards Western European and American aircraft, with a few exceptions). The point of discontinuity lies in air-crew training, with air carriers forming their own training centres instead of employing former military or sports pilots, but this was done as part of a global trend of training commercial pilots from the very start. All of this means that Yugoslav air transport was a system in constant change and modernisation which nobody resisted, and which was practically always in line with major global trends in civil aviation.

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