FLARE AVIATION CONSULTING

ECONOMIC IMPACT STUDY OF AVIATION

FOR CONNECTICUT & EAST HAVEN

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Foreword & Executive summary

In the global interconnected world that we live in these days, air transportation has become a cornerstone in every person, professional or corporation. From a leisure trip to the Caribbean to an envelope from an e-commerce, air transport plays a key role in this logistics. But, from a regional and local perspective, aviation is not just airplanes and runways.

The aviation industry can be represented as an intertwined network of professionals, infrastructures and industries that work altogether unified, generating efficiencies and synergies that translate, at the end of the day, into economic development for the region. According to the World's airlines association, IATA, the aviation industry supports more than 4.2% of the US economy throughout all the economic impacts of the aviation, which not only includes the direct business generated by airlines and airports, but also to those industries that are highly dependent of the air transport, such as tourism.

However, if we look at these economic impacts at Tweed New Haven Airport (onward referred as "Tweed" or "HVN"), the reality is far from this national scene. The multiple constraints that the airport faces nowadays, such as the runway distance, generate great limitations for people and businesses in South Connecticut in terms of air connectivity, hindering people and corporations' productivity, as well as the potential economic impact to the region in terms of employment and economic development.

This study aims to reflect the potential economic impact that East Haven and the South Connecticut region could have from the aviation sector, if infrastructure constraints would be removed.

Andreu

Andreu Carbonell
Managing Director

Regional economic impact of aviation in HVN

If airport constrains were removed, and 1 million enplanements would be reached, the impact would be...

Direct impacts
USD 288mm

Indirect impacts
USD 89mm

Induced impacts
USD 97mm

Employment

+11,000 jobs

Full-time employees in Southern Connecticut would be generated, both as aviation and non-aviation related

Taxes

47 million

of overall State and local taxes would be generated

Potential Savings

1 million hours

of personal time savings due to the reduction of commuting time to other airports

Construction

+200 million

of overall economic contribution to the region on construction

1. Introduction to economic impact at HVN
How aviation generates economic development

The relation between aviation and development

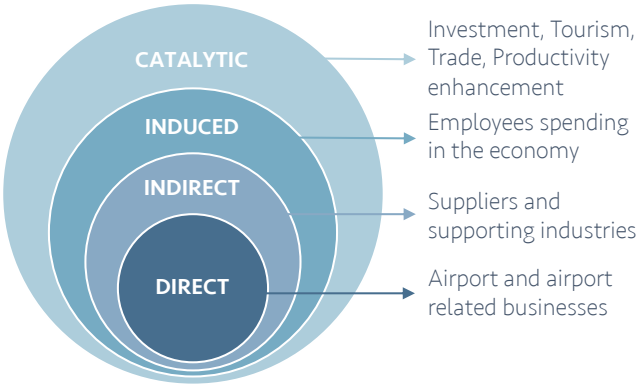
The relevance of the economic contribution of aviation to specific regions is undisputable. At a national level, the aviation contributes more than 4.2% of the total US economy. This contribution though is not generated by those businesses related to the aviation alone. Instead, this economic impact is calculated as all the economic contributions of all industries, thanks to the aviation sector. Those impacts generally include:

- **Direct Economic Impact.** Represents the economic output of the activities at the airports including firms on-site at the airport and airport-related businesses located elsewhere near the airport. This includes activities by the airport operator, the airlines, airport air traffic control, general aviation, ground handlers, airport security, immigration and customs, aircraft maintenance, and other activities at the airport.
- **Indirect Economic Impact.** Represents the economic output of the down-stream industries that supply and support the activities at the airport. For example, these could include wholesalers providing food for inflight catering, oil refining activities for jet fuel, companies providing accounting and legal services to airlines, travel agents booking flights, etc.
- **Induced Economic Impact.** Represents the economic output of the activity generated by the employees of firms directly or indirectly connected to the airport spending their income in the national economy.

For example, an airline employee might spend his/her income on groceries, restaurants, childcare, dental services, home renovations and other items which, in turn, generate employment in a wide range of sectors of the general economy.

- **Catalytic Impacts.** Catalytic impacts capture the way in which the airport facilitates the business of other sectors of the economy. As such, air transportation facilitates employment and economic development in the national economy through several mechanisms, especially tourism which is the largest and most representative catalytic impact, given that a large part of tourism is generated through air travel.

Economic impacts in aviation
By type (Source: ACI)



Regarding Southern Connecticut & East Haven, these economic impacts are undervalued nowadays, due to the important constraints that airport infrastructure is posing to airlines in establishing new direct routes. Instead, this economic contribution is shifted to other cities.

Capital projects foreseen at Tweed Airport

With the master plan update that Tweed is currently undergoing, the airport infrastructure is at a very important crossroad. This master plan, which is a road map for future land use planning at the airport, is considering extending the runway. If FAA approves the runway extension proposal proposed in the master plan and is subsequently developed, aircraft will be able to fly to destinations further away. This would allow Tweed to serve several non-stop destinations directly rather than through connecting flights.

The runway extension proposed, an increase of roughly 20% of the runway length, could define a whole new market for the airport. Just as an illustrative example, this new runway length could allow most of the US airlines to take-off from HVN and serve top destinations in the US, namely Miami, Las Vegas or Los Angeles, as well as some destinations in the Caribbean, including Puerto Rico.

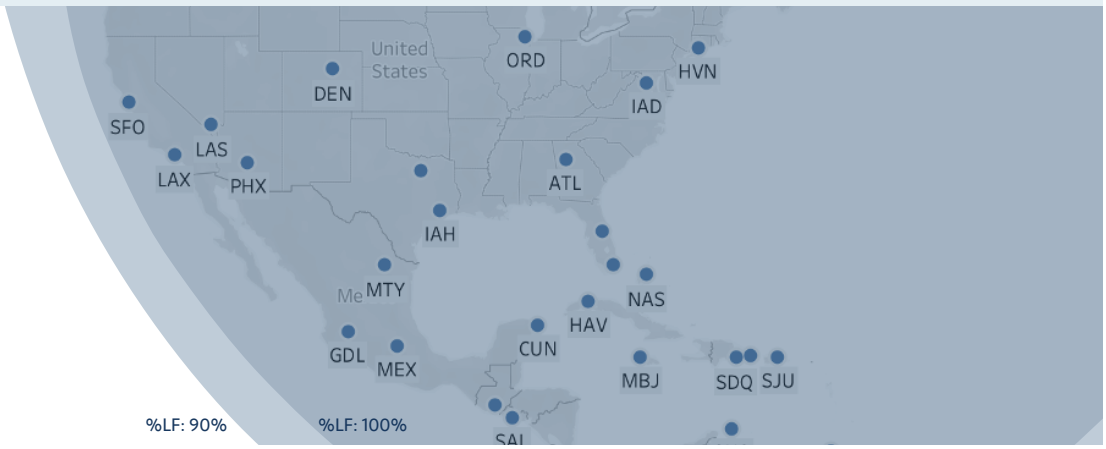
Besides, the runway extension would certainly allow to serve all the untapped air travel demand that is currently not flying, or is leaked to other surrounding airports, including Bradley or those in the New York area.

> ***"The new runway length could allow airlines to serve top destinations in the US, namely Miami, Las Vegas or Los Angeles, as well as some parts of the Caribbean"***

This demand uplift foreseen in the near future should, in return, require additional infrastructure to serve, not only the additional airplanes that will fly in and out of Tweed, but also the additional passengers and services that will generate such demand.

For that reason, the master plan document is also contemplating a new passenger terminal building in the East side of the airport, as well as all the complenetary services and infrastructure required for a new terminal, including access roads and utilities.

Range map of airplanes* from HVN
With future runway length and a load factor of 90% (Source: Boeing ACAPs, Flare)



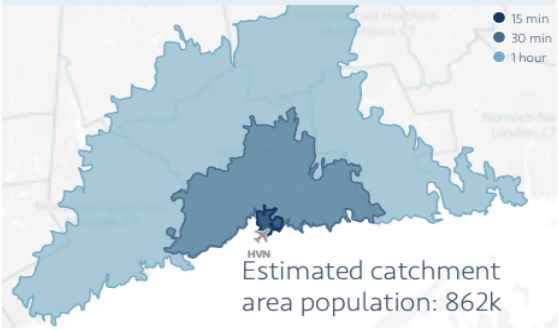
Tweed potential demand

In 2019 before the Covid impacted the air traffic, HVN handled approximately 50,000 annual enplanements. The vast majority of these passengers were carried by American Airlines to Philadelphia, one of its key hubs. From that hub, AA distributed passengers to some hundreds of destinations both in the US and overseas

Derived from an internal analysis Flare Aviation Consulting carried out, more than 97% of the air travel originated to/from New Haven county, is using another airport to get to their destination (i.e., JFK, La Guardia, Bradley, etc.). This level of "leakage" is extremely high, compared to other similar regions where this tends to be around 15% to 30%. In that sense, we believe that there is a large untapped potential for passengers to fly in and out of HVN, if commercial airlines could provide the correct connectivity with the correct airplanes at Tweed Airport.

Flare carried out an independent demand forecast which showcased that, if infrastructure limitations would be removed, Tweed could achieve 1 million enplanements in the the medium to long term by reducing this leakage to other airports and allow people from the South of Connecticut to use Tweed as main airport, for both their leisure and professional air travels.

Map of isochrones from Tweed Airport
15, 30 and 60-minute areas (Source: Flare)



Some facts about air travel demand at HVN

- 2019: 50,000 enplanements; potential for 1m
- Current destinations: Philadelphia and Charlotte
- Aircraft types used: Embraer 175 (others with limitations)
- Leakage: 97% going to other airports

2. Calculation of the economic impact
How much economic impact aviation generates

How is economic impact calculated?

There are different academic approaches to calculate the economic output of a specific activity and its multiplier effects. However, the most used methodology within our industry is by using Economic Data from the government that relates the impact of $1 in the aviation to the rest of the industries. In this specific case, Flare has used the data provided by the Bureau of Economic Analysis (government agency of the US Department of Commerce) for the aviation industry and the State of Connecticut.

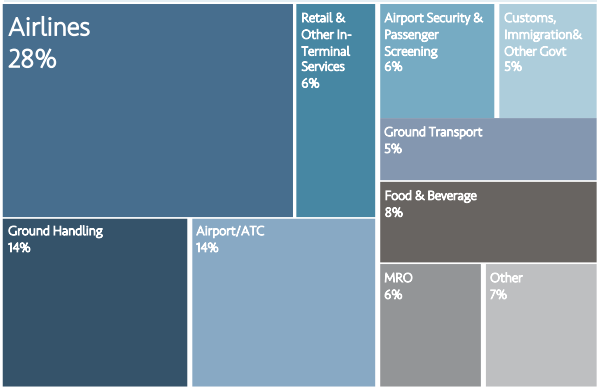
Direct impacts

The direct economic impacts are those directly related to the operation of aircraft and airports. This economic impact, for a region like East Haven, is generated not only from the airline operation at Tweed, but also to the numerous companies and services that surround such operation. That includes baggage handling services, F&B and retail in the terminal building, sale of aviation fuel, taxis and ground transport companies, and so on.

Multiplier impacts

Multiplier impacts refer to those economic contributions that are made indirectly related to the aviation business. On the one hand, so-called indirect impacts are those around the aviation supply chain (service like bookkeeping, legal services, or supplies like catering or utilities) to companies directly related to the aviation. On the other hand, induced effects are those that are generated by the employee wage spending in local retailers and services, including housing.

Split of employment generation in aviation
Share % (Source: ACI)



Catalytic impacts

Finally, catalytic impacts are those activities that have apparently nothing to do with aviation-related services, but they could not happen without the air travel. The most common catalytic impact is tourism where, some of the tourists visiting New Haven area (leisure, work, visiting friends & relatives, scientific & academic, etc.), need to use air transport to get to Tweed Airport. In this study, these large impacts have not been considered, as we believe that most of this tourism is already generated through other airports.

Further intangible savings

Due to the unique characteristics of this project at Tweed, vast amounts of intangible, or non-monetary, savings have been identified. These are, basically, both time and fuel savings that could be originated by reducing commuting to other airports to catch a particular flight. In that sense, the large reduction of ground commuting movements generates:

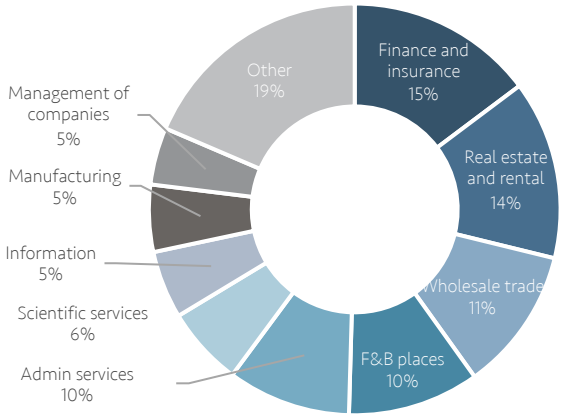
- **Time savings:** The reduction of ground transportation to other airports could be significantly large, due to the high transit areas some of these airports are in. A study with real-time traffic data showed that whereas the driving time to LaGuardia airport from East Haven can take 1:30h, at peak time this time can increase almost an additional hour to get to LGA. The annual savings, based on the DOT's time value, could add up more than USD 30 million a year.
- **Fuel consumption and green house emissions:** At the same time, commuting reduction would also decrease the amount of fuel/energy consumed for transportation, both public and private transport. In this case, the saving is calculated to surpass USD 6 million a year.

Economic impact on construction

The capital projects that are foreseen at Tweed by the master plan document would have also their own economic impact.

Besides the direct economic impact and the employment and taxes they generate, large construction projects have their own multiplier effects down the value chain, including numerous suppliers and contractors that are hired for that work, as well as all the retail and personal spending that employees generate through their wages.

Impact of aviation to other industries - Connecticut
Share of the economic impact – (Source: BEA)



In that sense, the overall economic impact of the works foreseen at Tweed could add up more than USD 200 millions in the short term, generating more than 1,170 full-time jobs during the construction period, as well as more than USD 10 mm in State and local taxes.

Other construction economic impacts such as runway repair, terminal refurbishments, etc. are included in the direct economic impacts previously mentioned, as they are part of the day-to-day operations.

Results on overall economic impact

The results of the overall economic impact that could eventually become a reality if runway constraints are removed are summed up in the table below.

Overall, the economic output or contribution that the aviation and its multiplier effects could have on the South Connecticut (for 1 million enplanements specifically), would add up almost USD 500 millions per annum.

In terms of employment, the analysis Flare carried out showed that, with a volume of 1 million enplanements per annum, the Southern Connecticut region could add more than 11,000 full-time jobs created, not only by the aviation industry directly, but also due to its multiplier effects. Besides, the construction works expected in the short term would generate more than 1,100 full-time positions.

Finally, at State and local level, taxes would increase by USD +50mm per annum, mostly being sales and income tax, but also local taxes to an extent.

Summary of economic impacts (excluding catalytic effects) at HVN
Annual USD million unless otherwise stated – For 1 million enplanements (Source: BEA, Flare)

Annual impact for 1mm enplanements	DIRECT (Aviation-related)	INDIRECT (Supply chain)	INDUCED (Employee spending)	CONSTRUCTION (All impacts)
Total Economic Output ($mm)	288mm	89mm	97mm	209mm
Employment and wages (persons and $mm)	4,000jobs 132mm	2,513jobs 83mm	4,761jobs 113mm	1,170jobs 45mm
Local & State tax generation ($mm)	25mm	10mm	12mm	10mm
Tax generation for East Haven ($mm)		*2 million*		

3. Economic impact of aviation in taxes
What taxes aviation generates and at what level

Impact on employment & taxes

As explained in the previous section, a scenario of 1 million enplanement a year would be generating more than 11,000 full-time jobs. A significant part of those employees would be based in Southern Connecticut area, and most likely to be in East Haven and surroundings due to the proximity to the airport and related businesses. The wages generated by these employees would entail much more expenditure in local and regional businesses which, in turn, would generate a large sum of taxes in different forms.

- **Sales tax:** The general sales tax applicable in the State of Connecticut is 6.35% and would be generated from all those purchases of goods and services of the employees in the region. This tax, however, would be levied at a State level.
- **Income tax:** The income tax, both a Federal and State tax, represents a big part of the tax revenues through charging directly to wages and salaries. The State schedule for Connecticut ranges between 3% to 6.99% depending on the level of income. However, median salary range in the region stands around 5-6%.
- **Real Estate and Property tax:** Through the mill rate that most towns and cities have implemented as a primary source of tax revenue, East Haven has its own mill rate at USD 34.25 / 1,000 for both real estate and personal property tax. In this case, this tax should only be considered for those households that will be "added" to the city as new employees from abroad (coming from a different county and/or State).

Basis for calculations of the local taxes

Flare developed a model in order to determine the potential number of new households that could be settled in New Haven, as well as the resulting impact on local taxes both from real estate and personal taxes.

First, the number of total jobs that will be generated by type and regionality were calculated in order to determine how many jobs, what type of jobs and, most importantly, where these jobs would be created. For instance, most of the airline jobs generated would be located somewhere else, as most airline headquarters tend to focus in one large city (e.g., American Airlines in Dallas).

Secondly, Flare identified how many of these jobs would be "newly created" in the region, assuming that people with specific skills would move from other cities to the New Haven area. In that sense, there are plenty of aviation-related jobs that should be able to be filled in by skilled workforce already living in the New Haven area. However, some specific skills (i.e., airline station manager or air traffic controllers) could be found somewhere else, as they are scarce professional profiles to be found.

Third, and most important, we built a distribution model that, based on commuting preferences and behavior in terms of distance and housing price, allocates each of the "newly created" employees (and therefore households) that would eventually move to the area.

In that model, Flare considered the different towns and cities around Tweed Airport (including Hamden, East, New and West Haven, Branford, Guildford and North Branford as example) as places where potential new employees could be settling down. However, two factors were taken into consideration. First, the driving distance, as it is a key factor for foreign employees to determine the most suitable area for living (with similar cost of living). At the same time, the housing cost was also considered, as it represents a key factor for that selection as well.

Finally, with all those factors in mind, the number of new potential households that could be settled in East Haven were estimated at around 300 households (for a 1 million enplanements scenario).

With the number of households and the average housing cost of the town, real estate and property taxes were defined.

Yearly tax revenue generation in State & local taxes by HVN
Scenario of 1-million enplanements (Source: State of Connecticut, Flare)

East Haven's potential development land for new residential areas – Preliminary*
Areas identified as both residential and/or industrial with potential residential use

Key results on State & local taxes

The resulting tax revenue for the 1-million enplanement scenario at HVN shows almost USD 47 millions of tax revenue generated on an annual basis.

From that total, almost USD 28mm would be generated in terms of sales tax (collected by the State of Connecticut), USD 17mm by income tax of the State schedule (collected by the State of Connecticut) and finally the local taxes (both for real estate and personal taxes) would add up a total of USD 2 millions per annum, based on the results shown in our model.

Based on the historical budgets from both the State of Connecticut and East Haven, this tax generation could potentially contribute up to 0.3% of the total budget at a State level, and more than 2.2% on East Haven's annual budget. (This only accounts for residential developments, additional upsides could be originated from warehouses, industrial and office spaces.)

*The development land sites identified in this caption are non-binding and are purely based on the information provided regarding land uses

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