

# The Economic Impact of Dividing International Air Service between Houston Airports



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## Report Highlights

- The Houston Airport System's (HAS) April 4, 2012, study of economic impact of international flights from William P. Hobby Airport (**HAS Hobby Study**) reaches the wholly unrealistic conclusion that the new flying would result in 18,000 jobs and \$1.6 billion in annual economic impact. The HAS Hobby Study reaches these incorrect conclusions as a result of three basic, critical flaws in its assumptions:
  - Unrealistically low fares on the new routes, which in turn result in unrealistically high new passenger volumes;
  - Significantly overstated direct employment requirements at William P. Hobby Airport (**Hobby**) to support the new international flying, compared to current employment levels; and
  - That United Airlines (**United**) would not reallocate flying away from Houston to other, more profitable parts of United's network as a result of the drain of passenger traffic from George Bush Intercontinental Airport (**IAH**).
- Allowing international flights at Hobby would result in a net loss to the Houston region of 3,700 jobs and \$295 million in gross regional product. This net impact is the result of the loss of 5,000 jobs and \$414 million in gross regional product from impacts at IAH combined with the gain of 1,500 jobs and \$120 million gross regional product from impacts at Hobby.
- Adding Hobby international flights would jeopardize future growth at IAH and result in a reduction of 6% of United's current capacity and another 4% of planned capacity at IAH.
- International expansion by low cost carriers (**LCC**) does not stimulate service by incumbent carriers. In fact, based on analysis of other multi-airport metropolitan areas, it causes reduced capacity on overlapping routes.
- HAS debt backed by a 50% increase in Passenger Facility Charges (**PFCs**) paid by all Hobby customers would fund the estimated \$100 million cost of the Hobby international gates.
- United's local Houston domestic passenger share is 48%, compared to 31% for Southwest Airlines (**Southwest**), but, because of the connecting traffic United brings through IAH, United is able to offer more flight options to more destinations than Houston traffic alone can support. Today, IAH is United's largest hub. Since the 2010 merger with Continental, United has added 12 new nonstop routes from IAH, more than it has added from any other hub and the same number it has added at Newark Liberty (**EWR**), Denver International Airport (**DEN**) and Chicago O'Hare (**ORD**) *combined*.

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- Metropolitan areas with multiple airports providing international service have seen virtually no growth in international capacity over the past five years, as compared to more than 6% growth for unified international gateways overall and nearly 8% for IAH.
- United's growth at IAH and the resulting connectivity opportunities have benefited all 16 airlines that serve IAH and compete vigorously there. For example, Frontier just announced it would become the 17th carrier at IAH, citing the benefits of connectivity there. There is ample capacity at IAH to accommodate new flying.
- Adding an additional Federal Inspection Services (**FIS**) facility in Houston at a time of federal budget constraints would leave insufficient U.S. Customs and Border Protection (**CBP**) staff to serve customers effectively, further exacerbating the long customs processing time for IAH customers and degrading IAH's position as an international gateway.

## 1) Executive Summary

The Houston Airport System Director of Aviation, Mr. Mario Diaz, recommended in an April 9, 2012, letter to Mayor Annise Parker that the City of Houston (**the City**) accept the proposal of Southwest to initiate scheduled international air service through its subsidiary AirTran (**the Proposal**) at William P. Hobby Airport (**Hobby**). Mr. Diaz based his support for this recommendation on the HAS Hobby Study conducted by GRA and InterVISTAS.<sup>1</sup> United Airlines (**United**) undertook this study in collaboration with Mr. William Swelbar<sup>2</sup> and Dr. Barton Smith<sup>3</sup> to demonstrate the real impact of the Proposal on the Houston economy (**the United Study**).

The United Study will demonstrate that the HAS Hobby Study suffers from fundamental flaws that undermine all of its key findings. The flaws compound upon one another, resulting in a grossly exaggerated annual economic impact of \$1.6 billion and 18,000 jobs<sup>4</sup> from the addition of 23 international flights from Hobby. The United Study corrects the HAS Hobby Study's faulty assumptions and analysis and demonstrates that dividing international air service at Houston would cost the city close to 3,700 jobs and would result in lost gross regional product (**GRP**) of \$295 million per year.<sup>5</sup>

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<sup>1</sup> As Mr. Diaz's letter notes, "Critical to my recommendation are the results of economic impact reports completed at HAS's request..." and "...the report speaks for itself..."

<sup>2</sup> Mr. Swelbar is a Research Engineer in the Massachusetts Institute of Technology's International Center for Air Transportation, where he is affiliated with the Global Airline Industry Program and Airline Industry Research Consortium. Mr. Swelbar has spent 25 years in the consulting world with a focus on airline-labor cost restructuring, regulatory issues governing air transport, communication strategy and support, and air-service development on behalf of airports and communities. He also currently serves as a member of the Board of Directors of Hawaiian (Airlines) Holdings, Inc.

<sup>3</sup> Dr. Smith was assisted by Evert Crawford, Director of the Institute for Regional Forecasting. Dr. Smith is a Professor Emeritus of Economics at the University of Houston. He formerly taught and conducted academic research in urban economics and public finance. He has been affiliated with the University of Houston since 1973 and has previously served as Chairman of University of Houston's Economics Department, the Director of the Center for Public Policy and the Director of the Institute for Regional Forecasting. Dr. Smith has conducted numerous studies in urban, housing, transportation, and environmental economics and has published many articles in academic journals and books. During the past 15 years, Dr. Smith has gained national and local recognition for his analyses of the Houston economy and real estate markets. He wrote the Center's *Handbook on the Houston Economy* and continues to publish two symposium reports per year on Houston's economy and real estate markets. In addition to his academic work, Dr. Smith has served as a consultant to many national and local organizations, conducting analyses of real estate markets, regional economic trends, and socio-economic impacts. Dr. Smith is also a highly sought-after speaker by both profit and non-profit organizations from coast to coast.

<sup>4</sup> The 18,000 figure appears in HAS Exhibit 21 (18,111 jobs) and is the sum of the direct (3,167), indirect (3,714), and induced (11,230) jobs. On page 2 of the same report, they say that "New international air service at Houston Hobby and the resulting competition would generate...over 10,000 jobs across the greater Houston metropolitan area."

<sup>5</sup> Gross regional product is the market value for all goods and services produced in a region in a given time and is the regional equivalent of Gross Domestic Product (**GDP**).



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Many of the HAS Hobby Study's underlying assumptions (e.g., Southwest's projected fares) are also inconsistent with the HAS Hobby Study's own data. The HAS Hobby Study grossly overstates anticipated benefits for the City and should not be relied upon as the basis for making an important policy decision regarding the future of Houston's status as a global aviation hub.

The most critical flaws and most unrealistic assumptions of the HAS Hobby Study include:

- Basing passenger and economic stimulation forecast on wholly unrealistic decreases in fares on the new international routes launched from Hobby.<sup>6</sup> These hypothetical fare reductions are the result of compounding two serious errors: (1) using "projected fares" that are both unrealistically low and also directly contradicted by the HAS Hobby Study's own yield analysis; and (2) dramatically overstating the current fares from IAH on the hypothetical routes that are relevant to the HAS Hobby Study's fare comparison.<sup>7</sup>
- Assuming stimulation levels from the new service at Hobby that are not based on recent industry trends.
- Misrepresenting the causal links between LCC service and overall levels of traffic at a city.
- Using demonstrably incorrect assumptions regarding the current state of competition for air passenger service and fares in the Houston metropolitan area. For example, the HAS Hobby Study focuses on seat share rather than the share of origin and destination (**O&D**) passengers flying to or from Houston (the industry standard measure of market share) and compares average fares at Houston with those in other large U.S. metropolitan areas without consideration of local economic conditions.
- Erroneously assuming that United would not reduce capacity at IAH in response to expanded service by Southwest at Hobby, when basic economics and previous experience strongly suggest that the opposite would occur and when, in fact, United already has identified the capacity that it would reduce and the future growth that it would forego as a result of a second international gateway in Houston.
- Ignoring entirely the positive and well-documented network effects that large airline hubs generate through the symbiotic relationship between local and connecting traffic. Houston—more than any other United hub—has benefited from these positive effects as a result of the United/Continental merger, as United has added more new destinations at IAH than at any other of its hubs. The proposal, however, would place these benefits at risk.
- Making incorrect "cause-and-effect" statements based only on a cursory review of the data. For example, in one instance the HAS Hobby Study concludes that *de minimis* new LCC service at

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<sup>6</sup>See HAS Hobby Study, Exhibit 18.

<sup>7</sup>At the April 16, 2012, City Council meeting, even Southwest's representatives were non-committal regarding whether or not they would offer fares as low as those upon which the HAS Hobby Study is based.

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Chicago Midway *caused* increased competitive legacy carrier service, ignoring the more significant fact that a primary competitor (Mexicana) went bankrupt and exited the city. In another case, the HAS Hobby Study purports to show that the incumbent network carrier, American Airlines (**American**), expanded service at its Miami International Airport (**MIA**) as the result of LCC entry by JetBlue at Fort Lauderdale (**FLL**), when, in fact, MIA grew as a result of American dismantling its nearby San Juan hub (which itself resulted from JetBlue's entry).

- Failing to consider the overwhelming number of both short- and long-haul connecting passengers for whose business Houston competes directly with American and Delta Air Lines (**Delta**) hubs at Dallas/Fort Worth (**DFW**), Hartsfield-Jackson Atlanta (**ATL**), and MIA, among others. By undermining the viability of IAH as a hub, the HAS Hobby Study's recommendation would diminish Houston's status as a premier gateway where it competes with these other hubs.
- Assuming airline- and airport-related employment effects from the new Hobby services that are entirely inconsistent with current levels of employment at Hobby. For example, the HAS Hobby Study assumes that for each 1,000 newly stimulated passengers at Hobby (as a result of the proposed services), 2.45 airline jobs would be added, even though HAS's own 2011 study (**HAS 2011 Study**) found that each 1,000 Hobby passengers accounts for only 0.98 airline jobs.<sup>8</sup>
- Speculatively asserting economic benefits per-gate that are inconsistent with the HAS 2011 Study published by the same consultancy not 18 months ago.<sup>9</sup> For example, the HAS 2011 Study found that the Houston airports drive about \$28 billion in economic benefit to Houston, or approximately \$195 million per gate. In the HAS Hobby Study, however, the purported economic benefit is \$325 million per gate, two-thirds higher than in the previous study.
- Inflating economic impact figures by incorrectly focusing on "output" (i.e., sales) as the measure of economic impact rather than value-added (or regional GDP). Put differently, the HAS Hobby Study counts the full value at each point that a good or service is sold, rather than just the added value at each point, substantially over-counting the impact.
- Ignoring the impact on wait times at IAH as a result of dividing CBP resources between the two airports, and also ignoring the difficulty of adequately funding the additional CBP expenditures in a time of tight government budgets.
- Ignoring potential environmental impacts of the Hobby expansion. This includes the impact of the HAS Hobby Study's purported increase in flights, increased traffic through congested areas, and other issues discussed below.

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<sup>8</sup> "Houston Airport System Economic Impact Study," prepared by GRA, Incorporated, June 30, 2011.

<sup>9</sup> Ibid.

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The United Study, in contrast:

- Derives the changes in passenger volumes using United's ordinary course of business Quality-of-Service (**QSI**)-based passenger forecast model, which the Company uses to plan and evaluate all of its network decisions.
- Acknowledges the delicate and symbiotic relationship between the amount of flow traffic and the economic viability of a hub and accounts for well-understood network effects by assuming that United would re-allocate current and future flying elsewhere in its network to maximize returns in response to Southwest's entry into international markets from Hobby.
- Recognizes that unified international gateways maximize the ability to connect passengers to and from international flights, thereby providing greater incentives for other international carriers to offer non-stop services to Houston and increasing the number of international destinations that are served by *all carriers* from the City.
- Draws conclusions regarding fares and capacity stimulation resulting from LCC entry based on a rigorous—rather than cursory—analysis of the available and relevant data.
- Retains Dr. Barton Smith, an expert renowned for his intimate knowledge of the local Houston economy, to analyze the effect of these more reasonable assumptions on the Houston-area employment and income.
- Demonstrates that dividing CBP resources between the two airports will increase wait times and put IAH at a competitive disadvantage to other hub airports such as DFW, ATL and MIA.

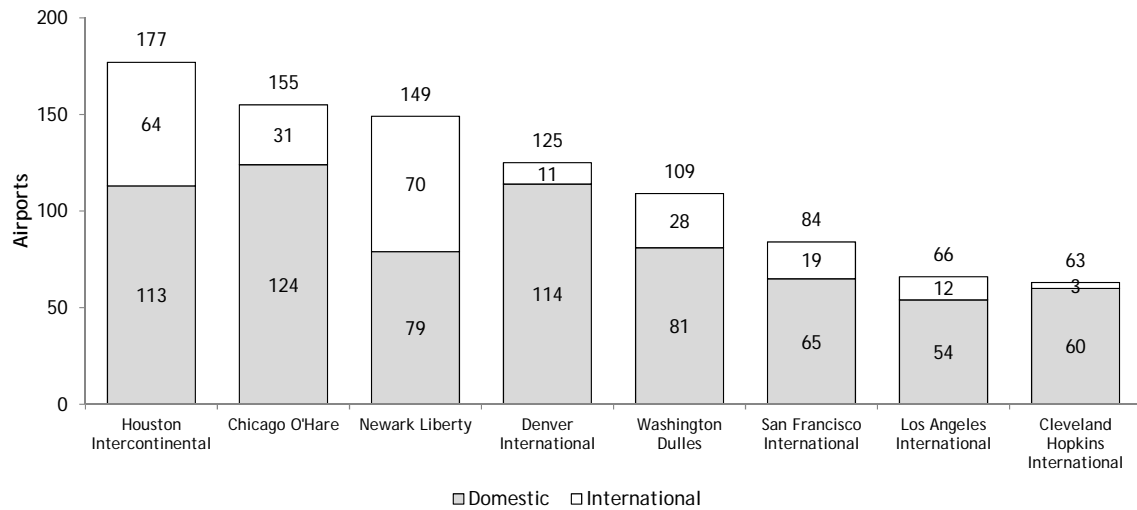
The remainder of the report is organized as follows. Section 2 provides a general introduction and overview. Section 3 explains why an international gateway hub such as IAH is so dependent on connecting traffic and why even a small decrease in that traffic can make a significant difference in the service offered. Section 4 describes and illustrates the inconsistencies and exaggerations in the HAS Hobby Study's economic impact analysis and sets forth Dr. Smith's analysis. Section 5 describes how the Proposal would be funded, not at the risk of Southwest, but at the risk of HAS, with its debt repaid by a 50% increase in the PFC paid by passengers traveling from Hobby. Section 6 explains how the Proposal would strain the resources of the CBP. Section 7 addresses how the HAS Hobby Study avoids any discussion of the significant environmental impacts associated with the proposed service. Finally, Section 8 provides concluding comments.

## 2) The Economics of Gateway Hubs

### a) United Remains Houston’s Committed Economic Partner

United has served Houston since 1951 — more than 20 years before Dallas-based Southwest began its Houston service — and, since that time, United has partnered with the city of Houston to build a world-class international gateway at IAH. As demonstrated in Exhibit 1, Houston is United’s largest hub.

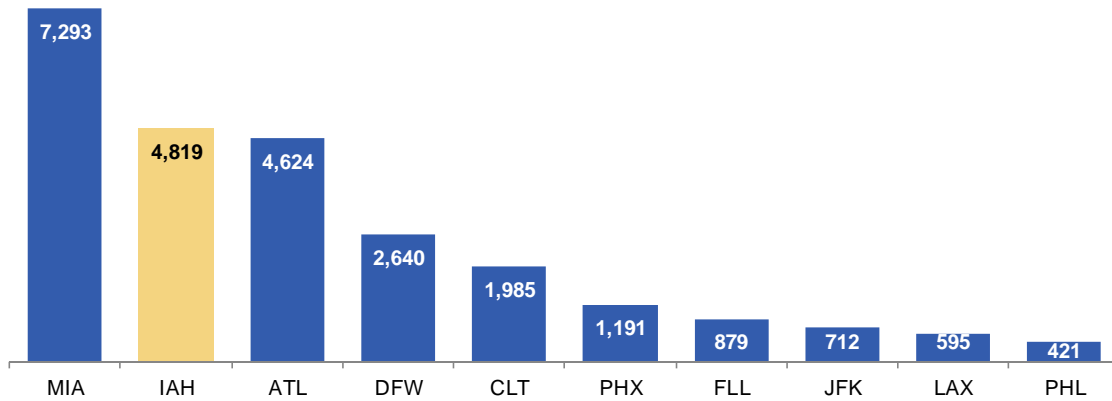
**Exhibit 1: IAH is United’s Largest Hub Offering Flights to the Most Destinations**



Source: OAG, June 2012.

As Houston’s sole international airport, IAH has been able to compete globally with hubs at DFW, ATL, MIA and other major international gateways by achieving a critical mass and realizing economies of scale despite serving only eight international markets that have a local demand of at least 100 passengers who travel per day each way (**PDEW**). The competition with these international gateway hubs is especially fierce for passengers making connections to Latin America.

**Exhibit 2: IAH is the Second Largest U.S.-Latin America Gateway Airport by Connecting Passengers PDEW**

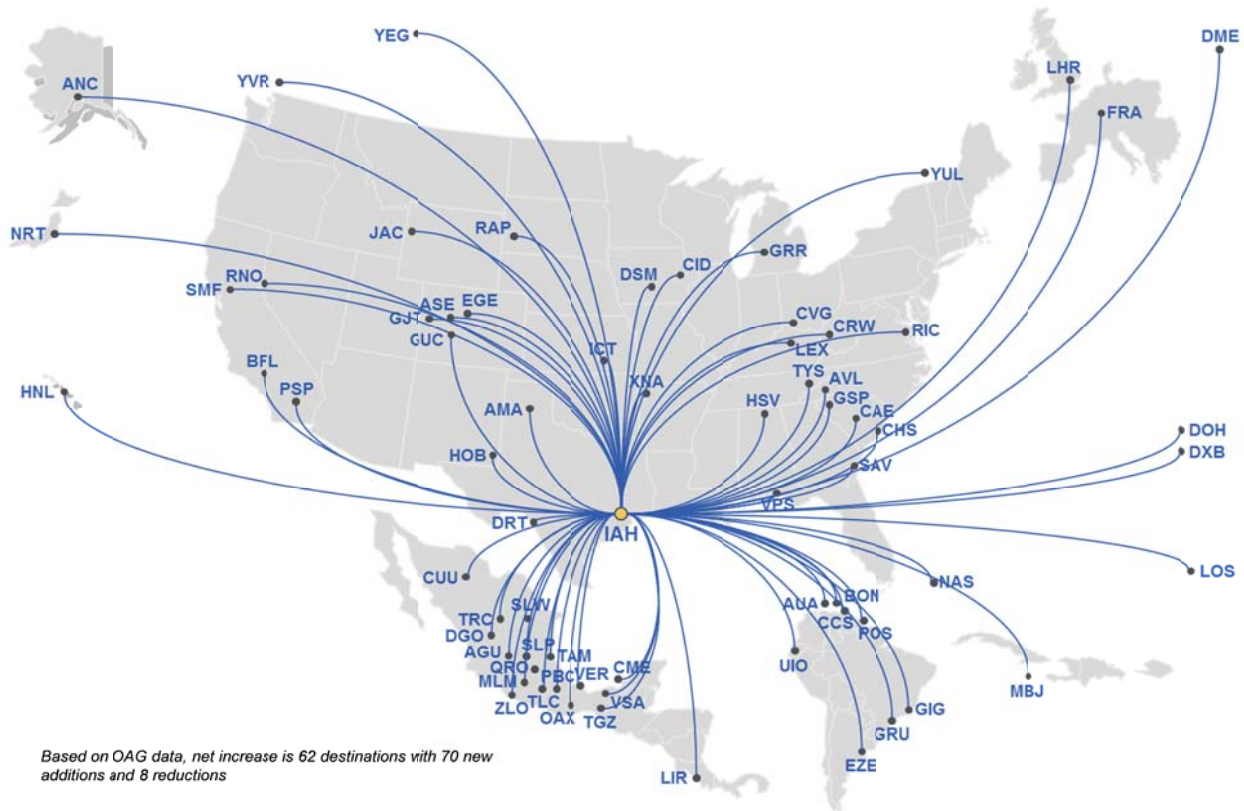


Source: SupersetTME September 2011

United has proven its commitment to long-term sustainable growth at IAH. Since 1996, United has invested almost \$1 billion in facilities at IAH, including \$268 million to construct the world-class Terminal E international connecting facilities, and nearly \$100 million for Phase 1 of a multi-phase project to renovate Terminal B at an additional cost to United of \$700 million. In addition, United has invested billions more in aircraft dedicated to the City and has sustained losses while developing new markets.<sup>10</sup> United made these investments in good-faith reliance on IAH remaining Houston's sole international airport as it has been since it opened in 1969. As a result, as shown in Exhibit 3 and Exhibit 4, Houston residents have benefited from the addition of scores of new non-stop destinations from IAH since 1996.

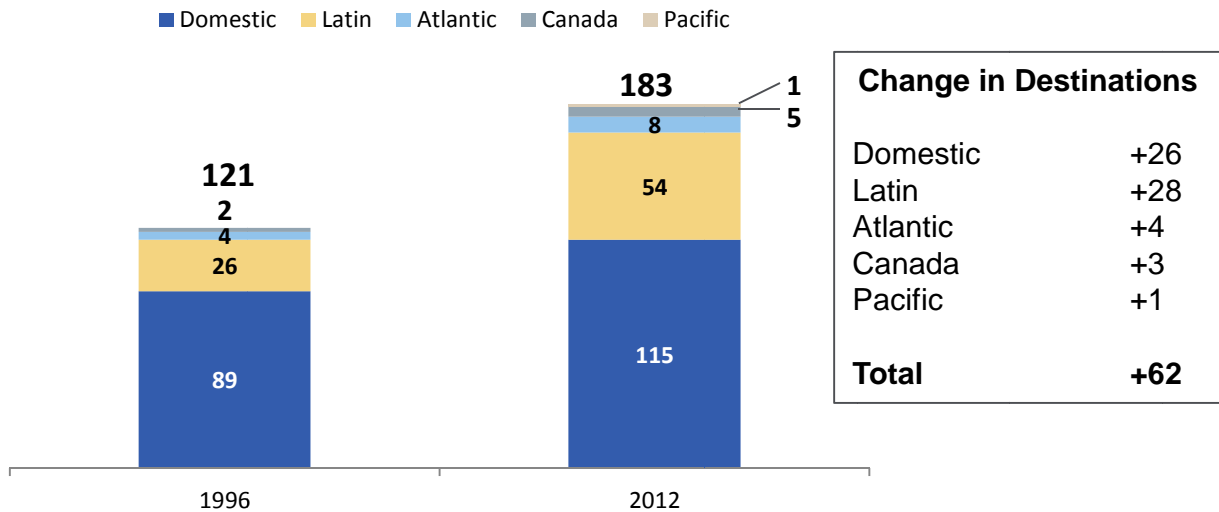
<sup>10</sup> In addition, HAS has invested \$440 million into the existing FIS as part of the International Services Expansion Program (at one of the airport's international terminals), and plans an additional investment to upgrade the infrastructure at an estimated cost of \$20 million for the first phase and an estimated \$300-400 million for a longer term reconstruction of the facilities to make IAH a world-class international facility.

**Exhibit 3: Growth in IAH Destinations Since 1996**



In total, the number of destinations from IAH has grown by 50% since 1996. Moreover, only ATL (the world’s largest airport) has added more international destinations than IAH since 1996.

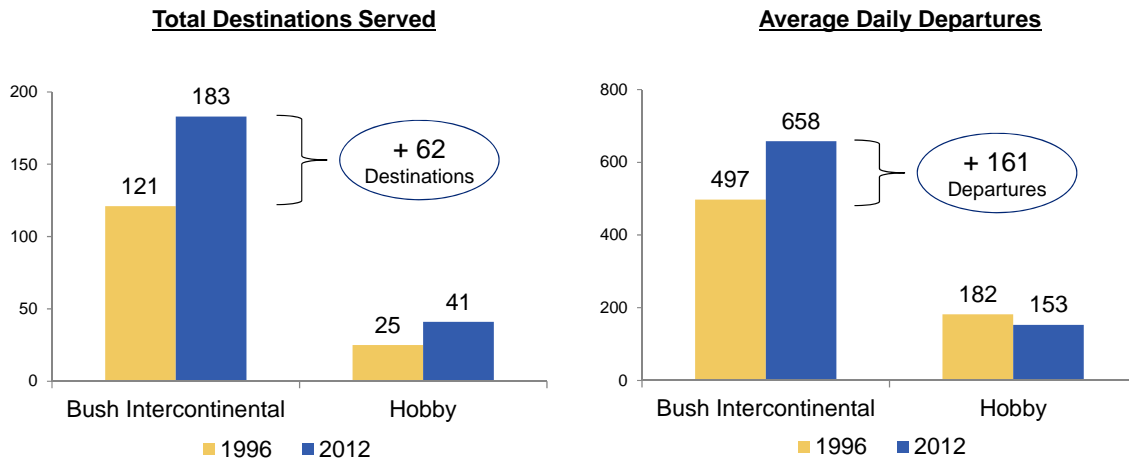
**Exhibit 4: Change in Number of Destinations Served From IAH, 1996 vs. 2012**



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Moreover, as shown in Exhibit 5, more service has been *added* at IAH since 1996 than exists *in total* today at Hobby.

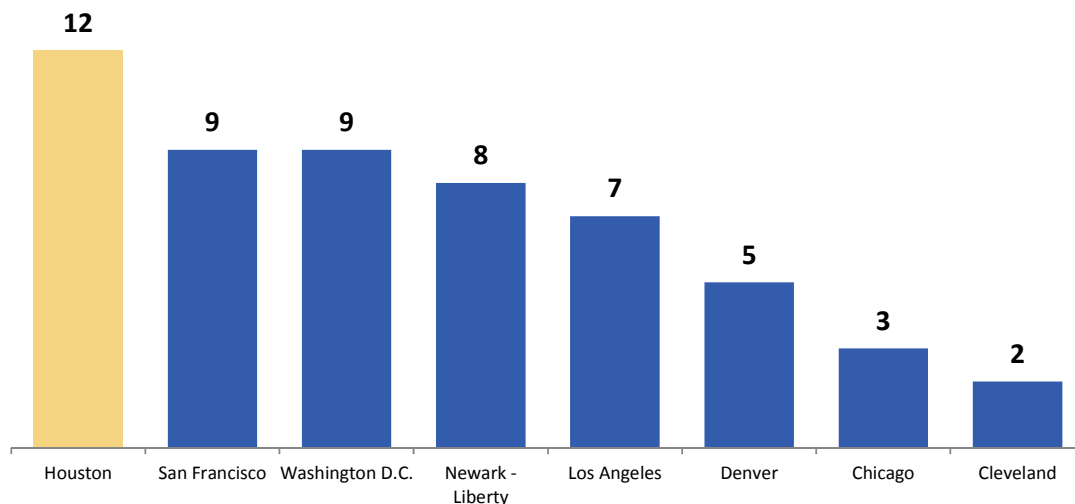
**Exhibit 5: Growth in Destinations and Departures, IAH vs. Hobby, 1996-2012**



Based on OAG data, calendar 1996 compared to TME July 2012

This investment in IAH has continued since the merger of Continental and United. As demonstrated in Exhibit 6, since the close of the merger, United has added 12 new non-stop routes from IAH, more than at any other United hub.

**Exhibit 6: New Non-Stop Routes Added Since October 2010 from United Hubs**



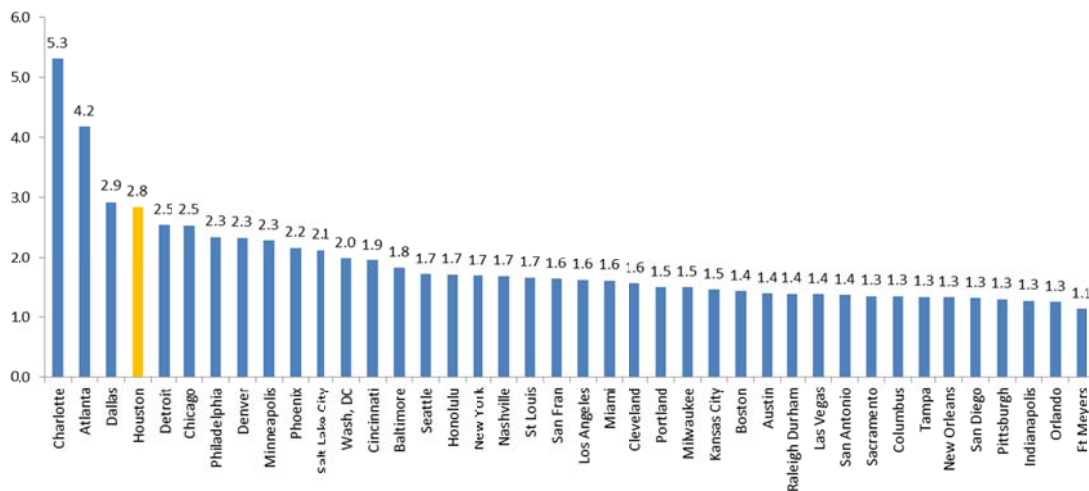
Note: Data based on OAG for Oct 2009-Sept 2010 vs. Oct 2010-2012, as of April 2012.

As a result of its rapidly expanding service at IAH, United’s overall capacity in terms of seats at IAH has grown sharply. In fact, United has added half as many seats at IAH since the merger as the proposed

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plan calls for Southwest to add as part of the Proposal.<sup>11</sup> The seats added to support connecting passengers also benefit local Houston passengers because of the many additional flight frequencies and destinations made available to Houston residents. As Exhibit 7 shows, Houston ranks fourth among U.S. cities in terms of seats per local passenger. Since 1996, the investment and focus by the City and United (then Continental) have vaulted Houston from ninth on this list to its current position, behind only DFW, ATL, and Charlotte (CLT). It is important to note that, of the top 10 largest air service cities by this measure, only one (Chicago) has split international gateways.

**Exhibit 7: Departing Seats per Local Passenger (Top 40 Cities in the U.S.)**



Note: Data based on OAG weekly departures for the rolling 12 months ending July 2012 and MIDT data for FY 2011

Moreover, United’s growth at IAH has benefited all of the airlines that serve IAH. In fact, Frontier Airlines just announced a decision to move from Hobby to IAH because “the great connection opportunities that Bush Intercontinental offers will provide our passengers with additional travel choices.”<sup>12</sup> As illustrated by Frontier’s move, there is ample capacity at IAH to accommodate new flying, and there is strong competition among the sixteen carriers serving the airport: AeroMexico, Air France, British Airways, Emirates, KLM Royal Dutch Airlines, Lufthansa, Qatar Airways, Singapore Airlines, AviancaTaca, VivaAerobus, United, Air Canada, Alaska Airlines, Delta, American, and USAirways.

<sup>11</sup> United has added 1,908 daily seats while the HAS Hobby Study forecasts that 23 daily international departures from Hobby, assuming 143 seats per departure, would add 3,289 daily seats. If one subscribes to the HAS approach of job creation and output associated with additional flights, then one would assign 5,000 jobs and \$800 million of output to the growth of United’s operations at IAH since the merger; however, because those assumptions are wrong, United does not make such claims.

<sup>12</sup> “Frontier Airlines to Shift Houston Operations Back to Bush Intercontinental in July,” Frontier Press Release, April 16, 2012.



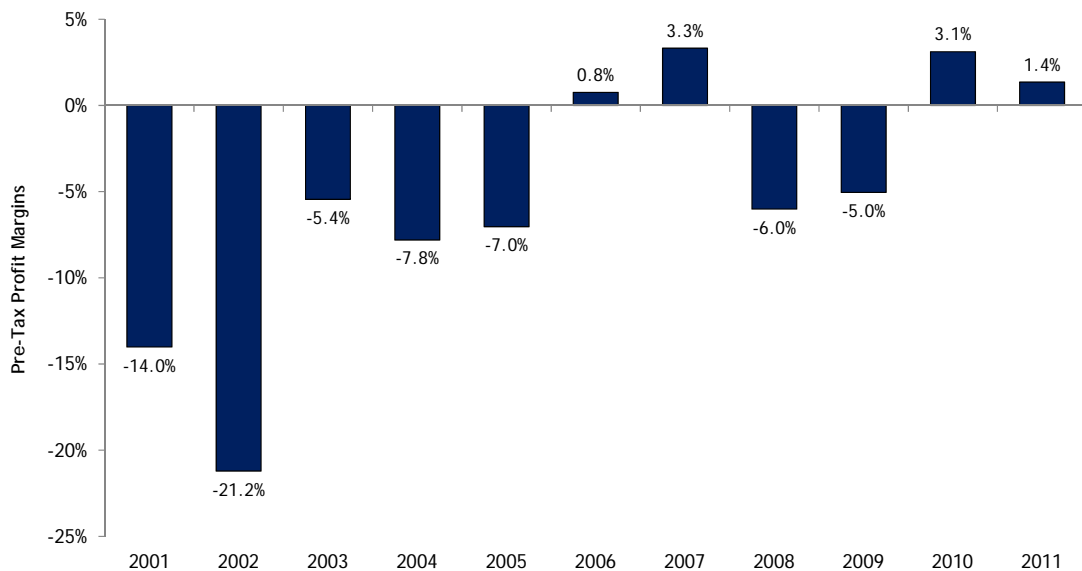
## The Economic Impact of Dividing International Air Service between Houston Airports

United made its network decisions on the assumption that IAH would continue as Houston's sole international gateway airport. If the City fosters dilution of connecting traffic, it will change the assumptions on which United made its investments and placed its assets. For example, United has plans to add additional services, including service to Auckland, New Zealand (**AKL**), scheduled to begin with the delivery of the Boeing 787 Dreamliners. However, a decision to degrade the network benefits at IAH by dividing international flow traffic will make markets such as these, which are heavily dependent on connecting traffic, no longer viable. Given the thin operating margins that characterize today's airline industry (discussed below), United will have little choice but to respond to those changed circumstances by re-allocating its limited resources to hubs where they will generate a better return.

### **b) Because Large Network Carriers Such as United Operate on Very Thin Profit Margins, Even Small Changes in Traffic Can Quickly Undermine the Economics of a Hub**

The airline industry is notorious for its low profit margins and exposure to external shocks and fuel-price volatility. As demonstrated in Exhibit 8, even in their most profitable years over the past decade, the large network carriers (e.g., United, American, Delta, Northwest, US Airways) have had a pre-tax profit margin of only around 3%.

**Exhibit 8: Pre-Tax Margins of the Large Network Carriers, 2002-2011Q3**

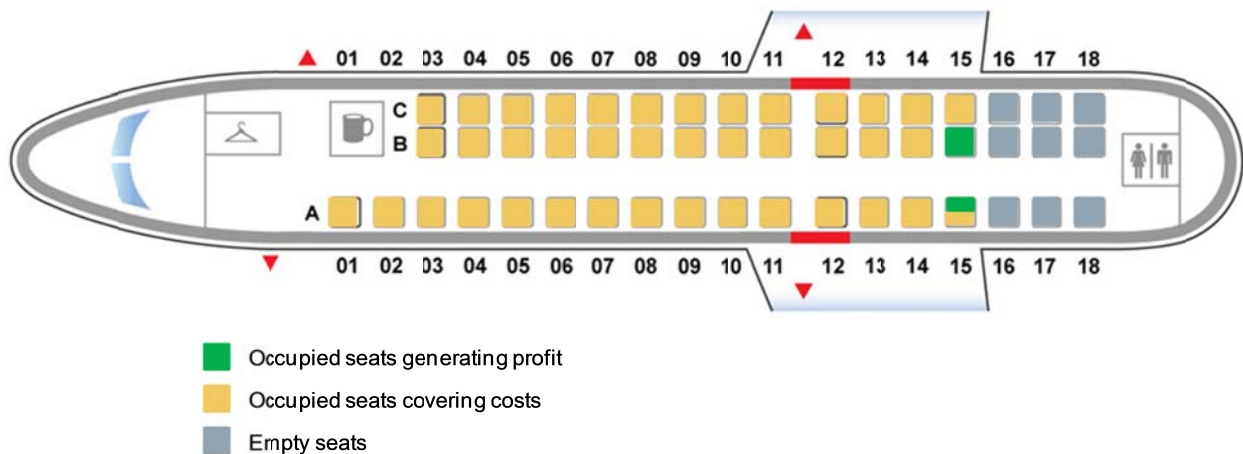


Sources: Carriers' SEC 10-K, 8-K and 10-Q filings; carriers' press releases; U.S. DOT Form 41: schedule P-1.2.  
Notes: 2007-2011 from 10K filings and adjusted for special charges. 2004-2006 from Form 41 and adjusted for restructuring costs. 2001-2003 from Form 41 and unadjusted. Carriers include American, United, Continental, Delta, Northwest, US Airways (including America West for all years), and TWA.

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At the flight level, the low profit margins of network carriers such as United mean that, on any given flight, the bulk of the passengers carried cover that flight's costs with only a few passengers generating a profit. Exhibit 9 illustrates this point.<sup>13</sup> On a typical flight with an 81% load factor, over 95% of the passengers cover the flight's fixed and variable costs, and only 3.6% of the passengers (i.e., approximately 1.5 passengers on a 50-seat aircraft) generate a profit.

**Exhibit 9: Only a Small Handful of Passengers on United's Flights Generate a Profit**



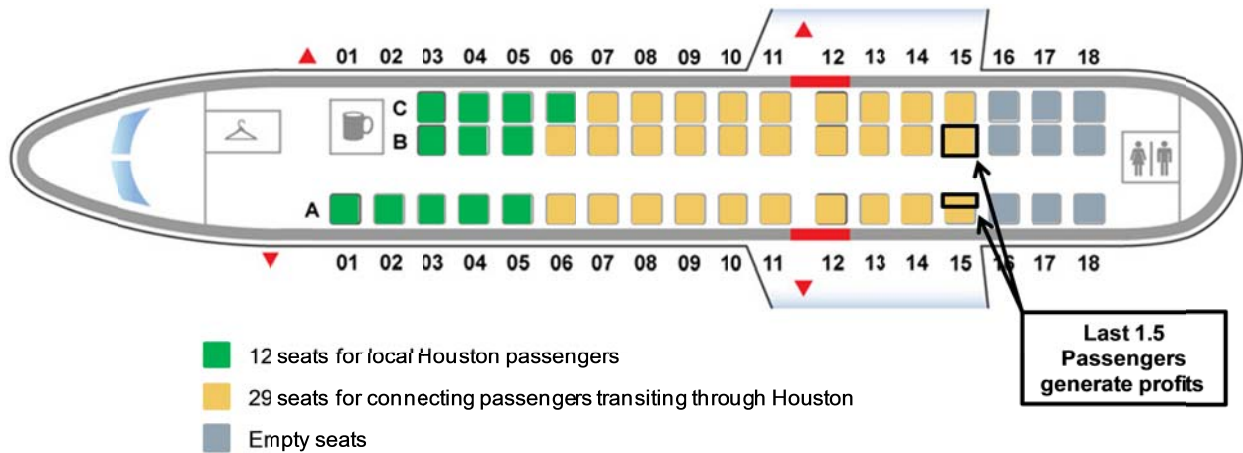
Source: United Flight Profitability System for five year period (March 2007 – February 2012)

Fragmenting international traffic at Houston between two airports would severely undermine the network economics of United's IAH hub and render certain routes unprofitable. Approximately three-quarters of the passengers on a typical United flight to Latin America from IAH are making a connection at IAH and, while these passengers are critical to the success of the flights, most have options of flying through other hubs. The importance of the *relative* competitiveness of IAH as a Latin-American-connecting hub cannot be overstated. United competes with American and/or Delta for nearly 90% of its passengers who connect at IAH to points in Latin America.<sup>14</sup> Therefore, weakening IAH's position relative to competitive hubs puts many IAH flights at risk.

<sup>13</sup> For the purposes of illustration, this exhibit uses a 50-seat aircraft.

<sup>14</sup> Source: Analysis of U.S. DOT DB1B data. Includes United passengers connecting over IAH on O&D city-pairs where either American and/or Delta have a 10% O&D share.

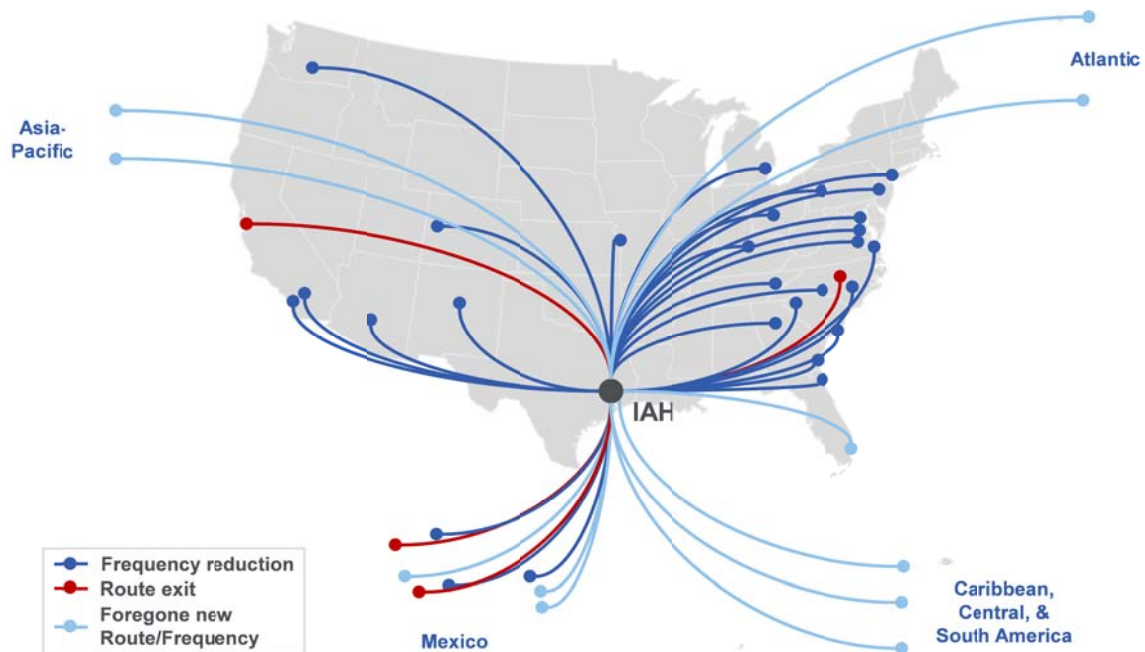
**Exhibit 10: Composition of Passengers on Typical United IAH flight to Latin America**



Source: United consolidated ticketing database for 2011

Because of these realities, as discussed above, United would be forced to cut service at IAH (see Exhibit 11) if international service were offered at Hobby. This response is based on United’s own price and market stimulation analysis using the same methods and data that United relies on for all of its planning.

**Exhibit 11: A Degradation of United’s IAH Hub Will Force United to Pull Down Service and Forego Growth Opportunities**



As a result of the Proposal, United would have to pull down current flights and cancel planned service to short-haul and long-haul destinations in the U.S., Latin America, and around the world. There is a

## The Economic Impact of Dividing International Air Service between Houston Airports

segment of United's operation at IAH that is not profitable today. United operates this flying relying on future growth improving the performance of the non-profitable routes. If international service were permitted at Hobby, however, some of the future growth would not occur and, as a result, United would cut unprofitable flying in its schedule. This would result in a reduction of about 6% of United's current capacity at IAH. As demonstrated by Exhibit 11 above, reductions would occur to several cities, including Charlotte, Detroit, San Jose (CA) and Louisville, as well as to various Mexican destinations, including Mazatlan. Additionally, new service that is currently planned would not occur because the reduction in connecting passengers would make this flying unprofitable from IAH. This includes the previously announced service to AKL and other planned service to South America, Europe, and Asia, along with a host of new domestic markets. In addition, as a result of the Proposal, United would not commence China service out of IAH. Overall, it is expected that total United IAH capacity ultimately would be 10% lower than had been planned.

How does Southwest's addition of AirTran flights from Hobby to Mexico impact United's ability to offer service out of IAH to places like AKL? The answer is best illustrated with an example. Today, United's Baltimore (**BWI**) to IAH flights each carry almost two passengers to Mexico City (**MEX**) per flight; in the future, but for the Proposal, those flights also would carry passengers connecting at IAH to AKL. As a result of the Proposal, assume that some of those BWI-IAH-MEX passengers would fly over Hobby instead. Further assume for argument's sake that the BWI-IAH flight is one of the segments of United's IAH operation that is not profitable today. If enough MEX passengers leave the BWI-IAH flights, United would need to reduce service on that route. The same logic would apply to a variety of other similar routes, which in turn would reduce the passenger flow over IAH needed to make IAH-to-AKL service profitable. In sum, if even a small handful of passengers are drawn away from United's IAH-based services, the flow generated by those passengers is lost. This undermines the economic viability not only of the particular routes on which they flew (e.g., BWI-IAH and IAH-MEX), but also that of a multitude of other current and planned routes (e.g., IAH-AKL) that rely upon critical feed traffic from the very same flights that would need to be eliminated.

Because of IAH's stature as United's pre-eminent hub, United offers services and has made investments at IAH far beyond what the City can support solely based on local (i.e., Houston) traffic. Moreover, to the benefit of Houston's residents and businesses, United has increased its commitment to Houston since its merger with Continental by adding more service at IAH than at any of its other hubs, and this has contributed to United's employment levels in Houston reaching pre-merger levels.

United now employs nearly 17,000 Houston and surrounding-area residents, close to the same number it employed before the merger. The overwhelming majority of these are long-time employees with established ties to the Houston community. The reduction in capacity that would result from Mr. Diaz's recommendation would stop that upward trend and, between lost current flying and lost future growth, would displace more than 1,300 United and United Express partner employees at IAH. United would try to find jobs for these displaced employees at its other hubs. These are not actions United wants to take, but are actions the City would force it to take if it were to divide Houston's international air service.

### **3) The HAS Hobby Study Suffers From Numerous Analytical Flaws and Incorrect Assumptions That Render Its Conclusions Invalid**

#### **a) The “Projected Fares” in the HAS Hobby Study—A Key Determinant of the Purported Stimulation of Traffic Because of the “Southwest Effect”—Are Unrealistically Low**

The HAS Hobby Study’s analysis of fares is critically flawed and inconsistent with the HAS Hobby Study’s own data. Because the projected fare reductions play a pivotal role in the “stimulated demand” that drives the HAS Hobby Study’s purported economic benefits, the flaws in the analysis serve to undermine the reliability of the entire study’s key findings.

The centerpiece of the HAS Hobby Study’s fare analysis is its Exhibit 18, which purports to find a percentage “Decrease in Fare” of as much as 83% on certain hypothetical markets as a result of Southwest’s international entry at Hobby. As described in detail below, not only does the HAS Hobby Study dramatically *overstate* the level of existing fares at IAH relevant to this analysis, it vastly *understates* the projected fares on the hypothetical routes that Southwest might enter from Hobby. The net result of these two compounding errors are projected “fare reductions” that have no basis in reality. Not only are they dramatically overstated and wholly unreliable as the basis for making an informed policy decision, they are also internally inconsistent with the HAS Hobby Study’s own analysis.

#### ***Southwest’s “Projected Fares” Are Vastly Understated***

A critical flaw in the HAS Hobby Study’s fare analysis is that Southwest’s “projected fares” (HAS Hobby Study Exhibit 18) are *vastly understated*. Although the HAS Hobby Study claims that “Southwest’s domestic market pricing was used as a proxy for its pricing of new international services,”<sup>15</sup> the projected fares are so low that they should raise concerns regarding the credibility of the entire HAS Hobby Study. In fact, they appear to be inconsistent with the HAS Hobby Study’s own model. To begin with, when one applies the yield equation in Exhibit 1-6 of the HAS Hobby Study (which is purportedly based on all of Southwest’s domestic routes) to the distance of each of the 11 routes in HAS Hobby Study Exhibit 18, it results in fares that are—on average—30% higher than the “projected fares” in Exhibit 18.<sup>16</sup> Moreover, when the yield curve methodology from HAS Hobby Study Exhibit 1-6 is estimated using Southwest’s domestic local *Houston fares* (as it should be because of differences in local

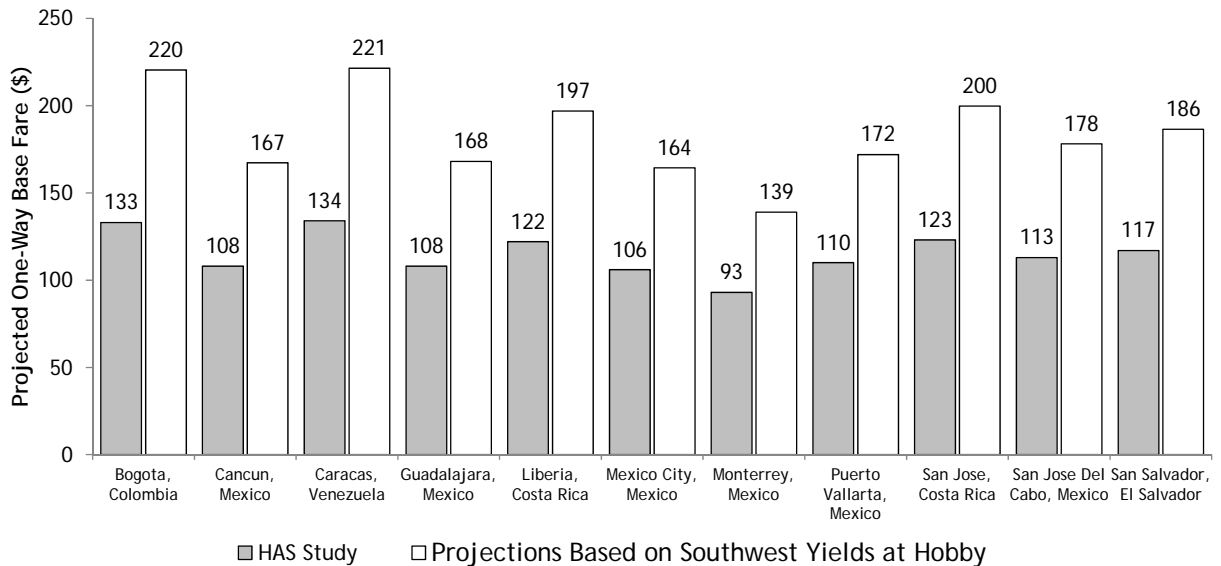
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<sup>15</sup> See HAS Hobby Study, Page 27.

<sup>16</sup> For example, applying Houston-Bogota’s distance (2,203 miles) to the yield equation in Exhibit 1-6 yields a fare of \$178, not the \$133 fare in Exhibit 18. Put differently, the “projected fares” in the HAS Hobby Study are internally inconsistent with Exhibit 1-6.

economies) and then applied to the same 11 routes, the resulting fares are, on average, nearly 60% higher than those projected in Exhibit 18 of the HAS Hobby Study. Moreover, the “projected fares” in the HAS Hobby Study are understated by even more than this would suggest because of a wide array of additional costs that are incurred by airlines on international routes, leading to international fares that are relatively higher than domestic fares on average.<sup>17</sup>

**Exhibit 12: Even Ignoring Additional Costs of Providing International Services, the Fare Projections Based on Southwest Hobby Fares are, on Average, Approximately 60% Higher than the HAS Hobby Study’s Projections**



Source: “The Economic Impact of International Commercial Air Service at William P. Hobby Airport,” GRA/InterVISTAS; US DOT O&D survey FYE 2011Q3.

Notes: Projections based on estimated regression equation in GRA/InterVISTAS Exhibit 1-6 applied to Southwest nonstop O&D fares from Hobby airport for FYE2011Q3 adjusted for fees and taxes.

***The Current IAH Fares Relevant to the HAS Hobby Study are Vastly Overstated***

In addition to vastly understated projected fares, the HAS Hobby Study has also overstated current actual fares at IAH. As a threshold matter, a simple comparison of *average fares* between IAH and even reliably derived “projected fares” for Southwest from Hobby would not be meaningful for several reasons. First, unlike Southwest, the primary carriers currently offering service on the 11 routes in HAS Hobby Study Exhibit 18 offer both First Class and Economy seating (and Economy Plus in the case of

<sup>17</sup> Among other costs incurred by international flights are: air navigation charges; labor and infrastructure costs associated with maintaining foreign air service (including regulatory and legal staff); additional slot acquisition and maintenance costs in many cases; increased related direct labor cost (including hotels, security, per diem); increased overhead associated with international gates; the need for language-qualified airport and inflight staff, ticket offices and distribution in foreign countries; and visas, work permits, and associated costs for labor.

## The Economic Impact of Dividing International Air Service between Houston Airports

United).<sup>18</sup> Because First-Class passengers choose to pay for a higher level of service (and flexibility) than Economy passengers, the inclusion of those passengers drives the average IAH fares upwards.

The second, equally important, reason that a simple comparison of *average fares* can be highly misleading is because frequent business travelers have travel patterns that can result in their paying higher fares than those paid by non-business travelers, as business travelers are likely to be attracted to IAH's more convenient schedule of flights and greater flight frequency, the availability of First Class and Economy Plus, the availability of airport lounges, and United's expansive frequent flyer program. As a result, it is reasonable to expect that a greater proportion of business passengers, who tend to purchase their tickets much closer to their date of travel and also tend to purchase more flexible (and thus more expensive) tickets than leisure travelers, will choose to fly out of IAH rather than Hobby. Differences in the "mix" of passengers alone can result in *average fares* that are substantially higher at one airport versus another (or, alternatively, across two different routes) even if the fares being charged to sub-groups of passengers are the same.<sup>19</sup>

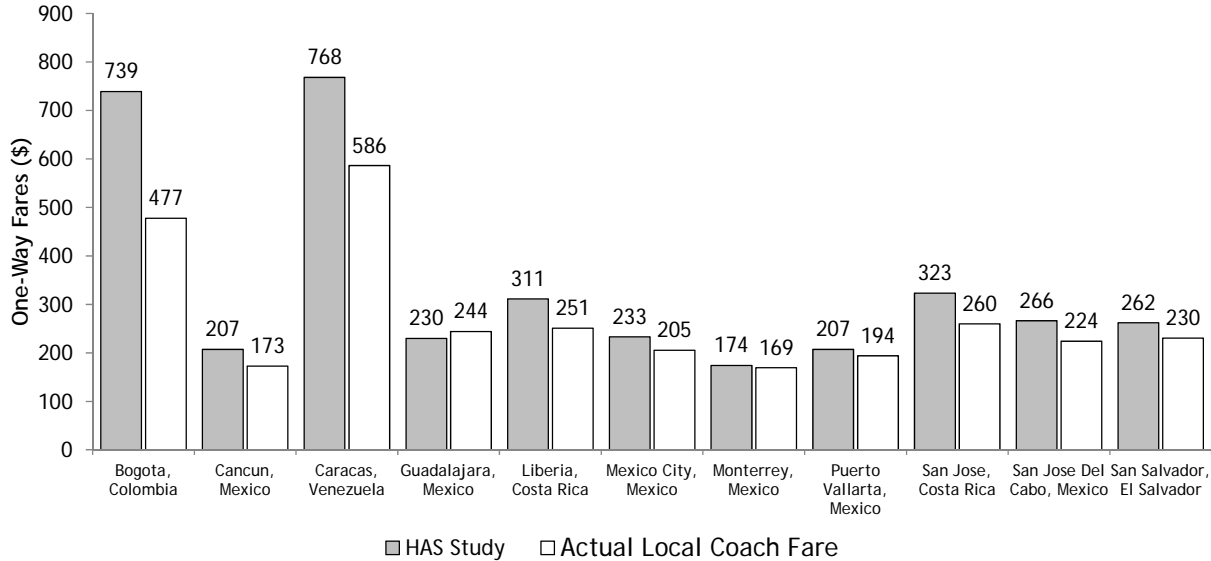
Turning now to the HAS Hobby Study's flawed fare analysis, consider the average base fares presented in Exhibit 18 of the HAS Hobby Study report, which are *average fares* for all passenger classes from IAH for the 11 Latin American routes the HAS Hobby Study claims Southwest might enter from Hobby. As discussed above, because Southwest offers only Economy class service, the IAH fares are *significantly overstated* for the purposes of the HAS Hobby Study's fare comparisons because they include all fare classes. Further, the fares are biased upwards since the fares are based on Global Distribution System (GDS) fares and, therefore, exclude many fares purchased directly from the airline or through other channels (i.e., consolidators) which tend to be lower fares. Exhibit 13 below demonstrates that, when fares are calculated using only passengers limited to United's Economy cabin (including Economy Plus), the average IAH fares are substantially lower. In the case of Bogota (a thriving business destination), excluding First Class fares reduces the average fare by \$260. On average, the HAS Hobby Study overstates the relevant IAH fares by an average of 18.5%.

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<sup>18</sup> The exception is VivaAerobus, which serves Monterrey, Mexico, but only offers Coach Class Seating.

<sup>19</sup> For example, consider two routes (A and B) with different mixes of business and leisure passengers. On Route A 25% of passengers are "business" passengers, while on Route B the proportion of business passengers is 50%. Further, Route A has an average business fare of \$1,000 and an average leisure fare of \$250, while Route B has a business fare of \$800 and a leisure fare of \$200. Even though Route A has higher fares for both types of passengers, the *average fare* on the route (\$438) is lower than the average fare on Route B (\$500), because Route A has a lower mix of business passengers. Hence, if one were only to examine average fares, one would erroneously conclude that the fares were higher on Route B (the route with a higher business mix) despite the fact that both the business and leisure fares were in fact lower than on Route A.

**Exhibit 13: The IAH Fares in the HAS Hobby Study are Substantially Overstated**



Source: "The Economic Impact of International Commercial Air Service at William P. Hobby Airport," GRA/InterVISTAS; United Airlines.

***The HAS Hobby Study Dramatically Overstates United’s Share of Houston Passengers***

The HAS Hobby Study, in attempting to show that United dominates air passenger service out of Houston, dramatically overstates United’s share of service in the Houston metropolitan area by focusing only on capacity (i.e., seat) shares. In fact, it has long been recognized by economists and aviation policy-makers that, in evaluating an airline’s share of a city’s service, one needs to analyze its share of the “local” passengers flying to or from the city. Focusing on seat shares is highly misleading because the seats to and from Houston carry both local passengers and passengers that are using the airport as a connecting point in their journey, but this is precisely what the HAS Hobby Study has done.<sup>20</sup> For example, Exhibit 5 of the HAS Hobby Study shows that the “United+Star” share of domestic seats at Houston (IAH and Hobby) is 66%. This is highly misleading for two reasons. First, United and US Airways (the only Star Alliance partner that offers domestic services at Houston) compete vigorously for Houston passengers and, thus, there is no basis for combining the two carriers. Second, because IAH is a hub for United, United connects far more passengers over Houston than does any other carrier, and, as a result, it is natural that United will have a relatively high seat share. But because fully two-thirds of United’s passengers at IAH are making a connection, United’s seat share far exceeds its domestic local passenger

<sup>20</sup> See for example “An Assessment of Some Recent Criticisms of the U.S. Airline Industry,” Darin Lee, *Review of Network Economics*, Volume 2, Number 1, (2003), noting that “Whereas O&D passengers are based on the start (i.e., origin) and end (i.e., destination) point of passengers’ journeys, enplaned passengers count each time a passenger boards an aircraft. Since network airlines carry a significant proportion of their passengers on a connecting rather than non-stop basis, the use of passenger enplanements to calculate market shares is misleading, as it effectively double-counts connecting passengers.”



share. Thus, in contrast to Exhibit 5 in the HAS Hobby Study, United's share of domestic local passengers in Houston is 48% while Southwest's share of the local Houston passengers is 31%.<sup>21</sup> Finally, it is important to emphasize that the HAS Hobby Study's inference that high airport shares (as a result of a carrier operating a large connecting hub) at an airport are detrimental to a city's economic development flies in the face of a myriad of economic impact studies that have shown the power that hubs have to positively affect a city's level of employment and economic activity.<sup>22</sup>

***Besides Being Based on Faulty Data, the Overall Fare Change and Traffic Stimulation Estimated by the HAS Hobby Study Also Contradict the Recent History of Southwest Market Entry***

An examination of the routes that Southwest has entered since 2006 shows that the huge stimulation and fare decreases that the HAS Hobby Study assumes for the new routes are completely out of line with what actually occurs when Southwest enters a market. Exhibit 14 shows that historically markets grew on average by 10% after Southwest's entry and fares actually increased slightly (4%). This is in stark contrast to the HAS Hobby Study's assumptions of a market growth of 180% — a growth rate 18 times higher than that evidenced by the most recent history — and a 55% decline in average fares.<sup>23</sup> Simply put, the HAS Hobby Study forecasts a change in price and traffic that is completely inconsistent with what actually occurs when Southwest enters a market.

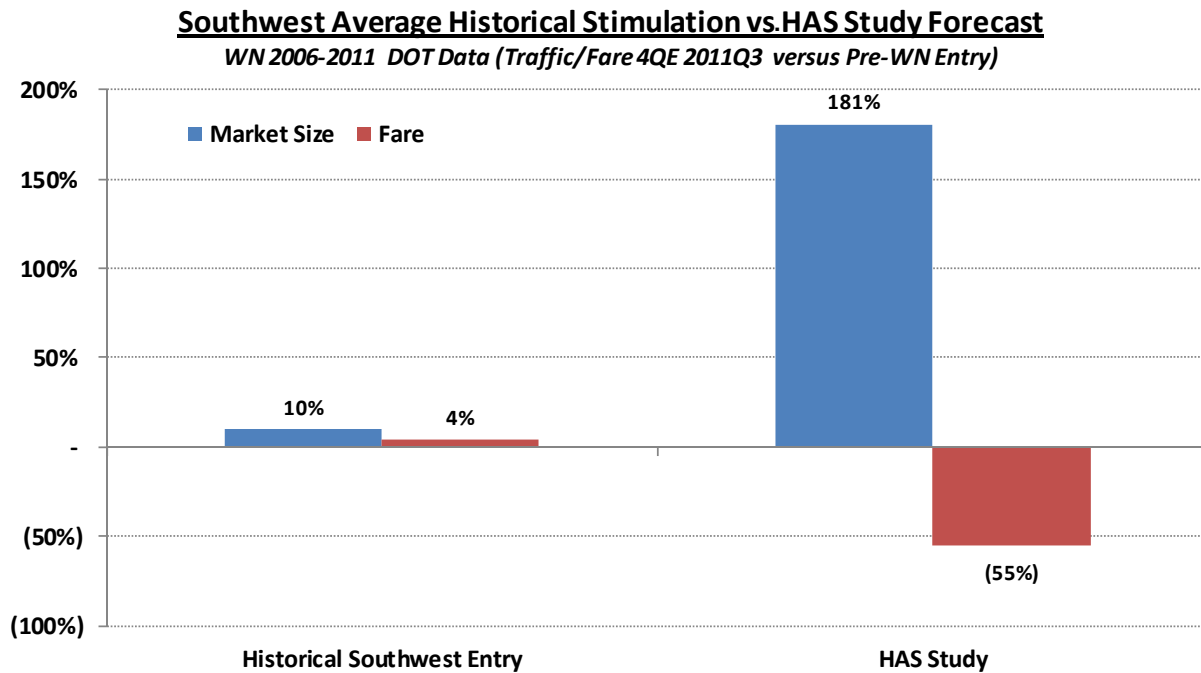
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<sup>21</sup> Source: U.S. DOT DB1B, full year ending 2011Q3.

<sup>22</sup> See for example "Airline Traffic and Urban Economic Development," Jan K. Brueckner, *Urban Studies*, Volume 40, No. 8, pp. 1455-1469 (2003), which concluded that, "The evidence confirms the common view that good airline service is an important factor in urban economic development. Frequent service to a variety of destinations, reflected in a high level of passenger enplanements, facilitates easy face-to-face contact with businesses in other cities, attracting new firms to the metro area and stimulating employment at established enterprises. The empirical results show that a 10 percent increase in passenger enplanements in a metro area leads approximately to a 1 percent increase in employment in service-related industries." See also "The Economic Impact of the Cincinnati/Northern Kentucky International Airport on Greater Cincinnati, May 2005," which noted that, "The location of a major airline hub at the Airport gives the region a higher level of service than it would otherwise have, and research has shown that the presence of such a hub increases an area's high-tech job growth," (page 4).

<sup>23</sup> The 180% is an estimate made by United of the stimulation rates used in the HAS Hobby Study (the actual rates were not provided). The 180% is derived using a) the local passengers onboard the Southwest flights, as stated by the HAS Hobby Study; b) seat share of the local market, as a proxy for the QSI share used by the HAS Hobby Study (but not provided); and c) existing local market sizes as estimated by United.

**Exhibit 14: Traffic and Fare Changes Proposed in the HAS Hobby Study are Inconsistent with Observed Results**

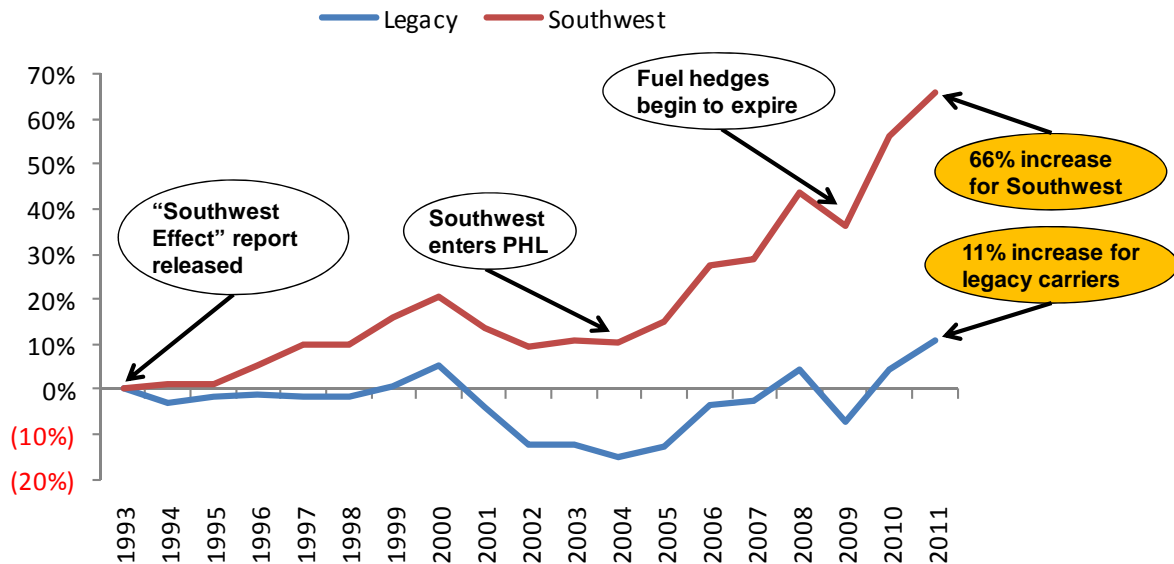


Moreover, an analysis of Southwest’s fare trends since the U.S. DOT’s 1993 “Southwest Effect” study (which Mr. Diaz’s letter to the Mayor cites for support) was released, shows quite a different picture than the one painted by Mr. Diaz.<sup>24</sup> As demonstrated in Exhibit 15, since 1993, Southwest’s domestic yields have increased approximately six times faster than that of the legacy carriers.<sup>25</sup>

<sup>24</sup> Bennett, Randall D. and James M. Craun. ["The Airline Deregulation Evolution Continues: The Southwest Effect"](#). Office of Aviation Analysis, U.S. Department of Transportation, May 1993.

<sup>25</sup> Similarly, a recent study found that Southwest’s fare quotes for last-minute bookings tend to be higher than the lowest fare quotes available on Orbitz for similar flights. See Bilotkach, Volodymyr, “Reputation, Search Cost, and Airfares,” *Journal of Air Transport Management* 16 (2010) pp. 251–257.

**Exhibit 15: % Change in Domestic Yield vs. 1993 for Southwest and Legacy Carriers**



**b) The HAS Hobby Study Assumptions Regarding the State of Airline Competition at Houston and Current Houston Fares are Unfounded**

The HAS Hobby Study is premised—at least in part—on flawed and demonstrably incorrect assumptions regarding the state of airline competition and the level of fares in Houston. For example, the HAS Hobby Study points to a study purporting to show that the Metropolitan Houston area has the highest fares in the country and one of the highest “fare premiums” in the country.<sup>26</sup> The HAS Hobby Study attempts to attribute these high average fares and fare premiums to United’s “dominance” at IAH.<sup>27</sup> A closer examination of the data, however—which the HAS Hobby Study failed to conduct—clearly shows that Houston’s higher-than-average fares are simply the result of a strong local economy in the Houston metropolitan area and not, as the HAS Hobby Study alludes, a result of airport “dominance.” Airline demand and hence prices are strongly influenced by the level of economic activity, and Houston has enjoyed a strong local economy over the past several years, especially compared to the broader U.S. economy. Indeed, this is consistent with the point Mr. Diaz made at the April 16 City Council hearings that the strong Houston economy helps to stimulate new traffic.

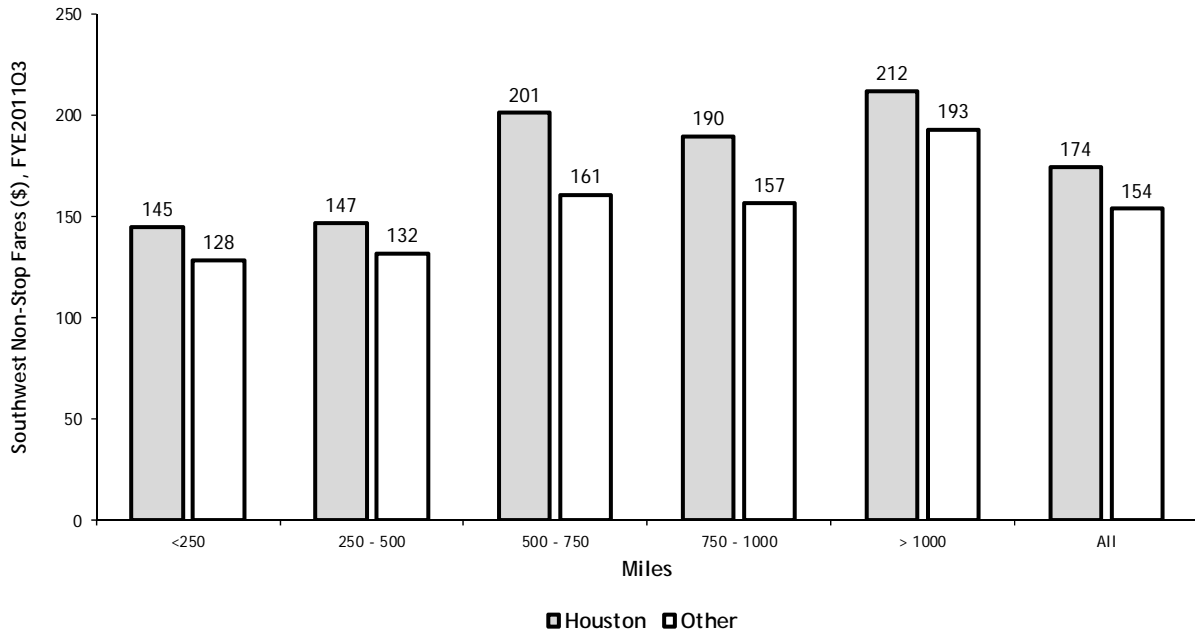
One simple way to establish that local economic conditions—and not market power—are the cause of Houston having average fares higher than the national average is to compare Southwest’s average fares from Hobby to its fares from the remainder of its domestic system. As demonstrated by Exhibit 16,

<sup>26</sup> See HAS Hobby Study, footnote 12.

<sup>27</sup> As discussed above, the HAS Hobby Study’s erroneously relies on seat (rather than local passenger shares) in support of its incorrect assertion that United is “dominant” in Houston.

Southwest also has benefited from the vibrant Houston economy, with its average non-stop fares from Houston-Hobby exceeding those from the remainder of Southwest’s domestic system in every distance band by a wide margin.<sup>28</sup>

**Exhibit 16: Southwest Airlines Average One-Way Fares, Houston vs. Remainder of System**



Sources: U.S. DOT O&D Survey. FYE 2011Q3.

Notes: Fares are one way. Other are non-stop O&Ds that do not include Houston. Average non-stop distance (each way) for Houston is 660 miles versus 719 miles for non-Houston O&Ds.

Simply put, the HAS Hobby Study contention that Houston suffers from “high” fares because of any alleged dominance by United is simply without basis.

**c) The HAS Hobby Study’s Analysis of Passenger Stimulation Resulting from Lower Fares Suffers from Numerous Fundamental Flaws**

The United Study does not dispute the underlying methodology that was used as part of the HAS Hobby Study to estimate the level of passenger traffic. Indeed, much of United’s own planning is based on

<sup>28</sup> As discussed in detail below, the HAS Hobby Study ignores entirely differences in fares based on local economic conditions in its own analysis when constructing its “projected fares” for Southwest, which are purportedly based on Southwest’s average domestic fares. As discussed earlier, even this analysis suffers from serious errors. Likewise, the HAS Hobby Study attempts to draw a link between the level of competition and fares at Houston and Chicago by purporting to show that fares from Chicago are lower than fares from Houston to select destinations. However, Southwest’s fares are also higher for Houston passengers than for Chicago passengers and this is true at every distance band.

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variations of a QSI model. The United Study's disagreement with the HAS Hobby Study lies in the underlying data and assumptions that the HAS Hobby Study uses as inputs to its model. Because the HAS Hobby Study relies on a series of fundamentally flawed inputs and assumptions, its results are unreliable and should not be used as the basis for a critical decision about the future of Houston's aviation policy, especially given the significance of Houston's air service to the city's overall economy.

To demonstrate this, the United Study will review the impact of the hypothesized schedule of international services at Hobby that the HAS Hobby Study outlines, without accepting that such hypothetical schedule would be viable. Indeed, as is demonstrated below, the projected fare levels that have been applied to the hypothetical schedule would generate substantial losses for Southwest (or any carrier flying the proposed schedule).

### ***International Service at Hobby Will Not Stimulate Traffic as Claimed by the HAS Hobby Study***

Mr. Diaz claims that international service at Hobby would generate an additional 1.5 million passengers traveling to, from and through Houston each year. The facts indicate that the proposed Hobby international service would stimulate far less traffic than that claimed in the HAS Hobby Study, and that ultimately it would lead to less capacity and traffic in Houston overall.

The economic benefits of launching international service are the greatest when the service represents new (i.e., first time) non-stop service between two cities, such as, for example, United's planned new service between Houston and AKL, and United's recently launched service between Houston and Lagos, Nigeria (**LOS**).<sup>29</sup> However, as demonstrated in Exhibit 17, all of the assumed Southwest-served international routes in the HAS Hobby Study already enjoy non-stop service, some multiple times per day.

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<sup>29</sup> A variety of studies have estimated that each new non-stop international flight generates millions of dollars in annual economic benefits to the United States. For example, a study conducted for the DFW found that a flight from DFW to Beijing would generate \$180 million per year for the state of Texas (see "DFW International Airport Releases New Economic Impact Assessment of Proposed American Airlines DFW-Beijing Route," Public Relations Department, Dallas/Fort Worth International Airport (Sept. 20, 2006). Similarly, a study conducted for DEN estimated that a single new international flight to Asia was worth at least \$142 million to the Denver local economy annually (see "Economic Impact of International Flights on Denver's Economy," [http://www.metrodenver.org/files/documents/transportation-infrastructure/air/Air\\_IntlFlight\\_EconomicImpact.pdf](http://www.metrodenver.org/files/documents/transportation-infrastructure/air/Air_IntlFlight_EconomicImpact.pdf)). InterVISTAS has also previously recognized the value of new international service, noting that "nonstop international services can often cause international traffic to double in only a year, even for city-pairs that already have a profusion of one-stop connecting services. Any mechanism that allows international services to proliferate to non-traditional gateways can be a powerful stimulus to traffic," InterVISTAS-ga<sup>2</sup> "The Economic Impact of Air Service Liberalization," p. ES-8.

**Exhibit 17: Existing Non-Stop Service on HAS Hobby Study Southwest Routes from Hobby**

		Average Daily Roundtrip Departures		Average Daily Roundtrip Departures
Bogota, Colombia	United	2.0		
Cancun, Mexico	United	5.3		
Caracas, Venezuela	United	1.0		
Guadalajara, Mexico	United	5.6		
Liberia, Costa Rica	United	1.5		
Mexico City, Mexico	United	8.1	Aeromexico	3.0
Monterrey, Mexico	United	8.1	VivaAerobus	0.5
Puerto Vallarta, Mexico	United	1.7		
San Jose, Costa Rica	United	3.2		
San Jose Del Cabo, Mexico	United	2.3		
San Salvador, El Salvador	United	2.0	Taca Int'l Airlines	1.0

Source: OAG, FYE2012Q2.

The HAS Hobby Study erroneously concludes that Southwest or another LCC entering these routes would result in increased traffic at IAH.<sup>30</sup> This conclusion, however, is based on the erroneous assumption that United would lower fares (while keeping capacity fixed) to such an extent at IAH in response to Southwest’s entry that it would actually fly more passengers, thus capturing some of the demand (both local and flow) resulting from lower fares.<sup>31</sup> In essence, the HAS Hobby Study argues that IAH, on net, would benefit from a smaller share of a much larger pie.<sup>32</sup> There are several flaws in this analysis.

First, as discussed above, there is a segment of United’s operation at IAH that is unprofitable today and that United operates in reliance on future growth improving performance. International service at Hobby would limit some of that future growth and lead to United cutting unprofitable flying out of IAH.

Second, the HAS Hobby Study also argues that dividing international traffic within a metropolitan area poses no risk to the growth of that metropolitan area as an international hub by simply asserting, with no supporting empirical analysis, that other metropolitan areas like New York, Los Angeles, Chicago, Miami/Ft. Lauderdale, Washington/Baltimore, and the San Francisco Bay Area have multiple international airports, and that this has “successfully lowered fares and grown the air travel market.”<sup>33</sup> As demonstrated by Exhibit 18, however, metropolitan areas with multiple airports providing

<sup>30</sup> HAS Hobby Study, Exhibit 16.

<sup>31</sup> It is interesting to note that in a previous InterVISTAS study, it was shown that in at least one case (the effect of the Open Skies Agreement on New Zealand air service), opening up markets to LCC competition came, at least partially, at the expense of the major carriers. InterVISTAS-ga<sup>2</sup> “The Economic Impact of Air Service Liberalization,” figure III-14 p. 50.

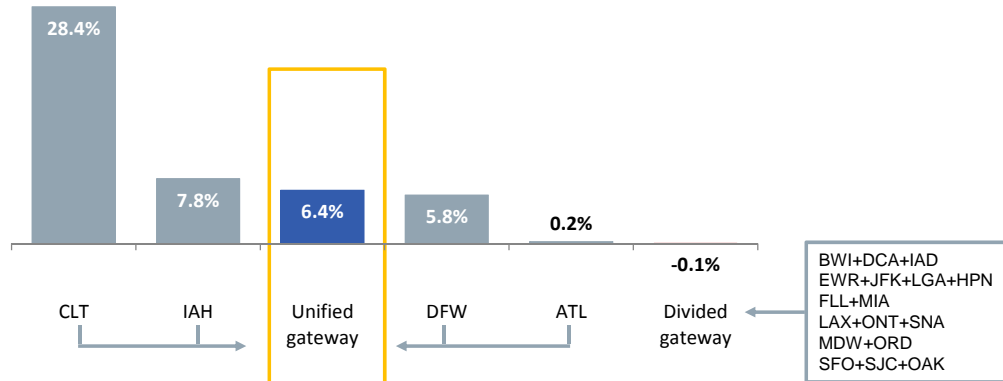
<sup>32</sup> HAS Hobby Study, Exhibit 1-14.

<sup>33</sup> HAS Hobby Study, page 2.

## The Economic Impact of Dividing International Air Service between Houston Airports

international service have seen virtually no growth in international capacity over the past five years, as compared to more than 6% growth for unified international gateways overall and nearly 8% for IAH.

**Exhibit 18: Five-Year Percentage Change in International Seats<sup>34</sup>**

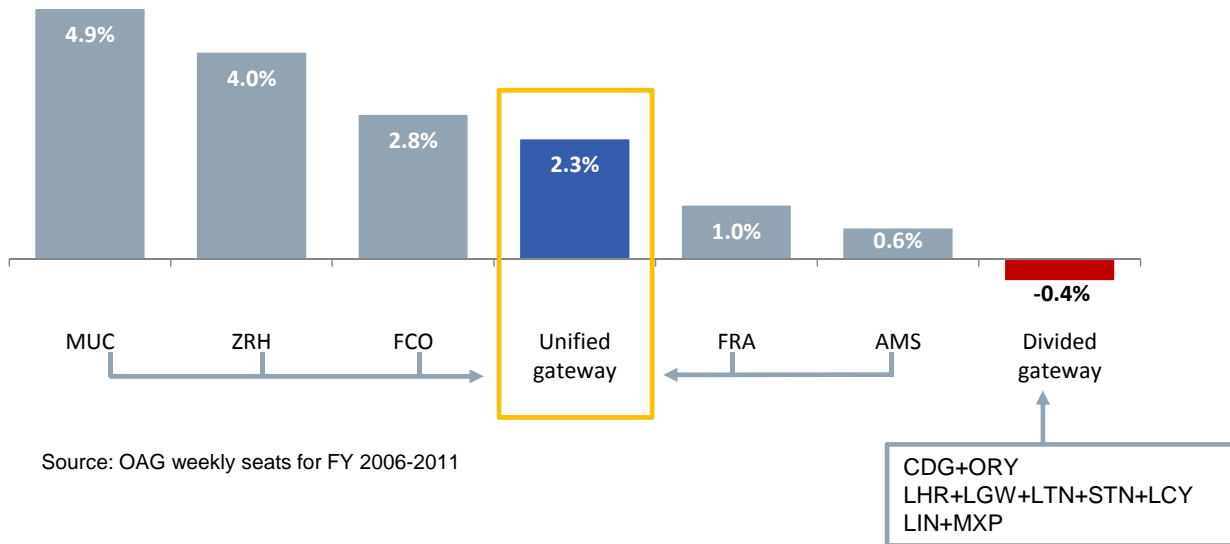


Source: OAG weekly seats for FY 2007-July 2012

The U.S. experience has been mirrored in Europe, where certain metropolitan areas (i.e., London, Paris, and Milan) also have divided their services between airports. As demonstrated by Exhibit 19, divided gateway hubs in Western Europe have shrunk over the past five years, while unified gateway hubs have grown.

<sup>34</sup> CLT, IAH, DFW and ATL represent the four largest domestic hubs measured by seats per local passengers. See Exhibit 7 above.

**Exhibit 19: Five-Year Percentage Change in Seats at Major Western European Hubs**

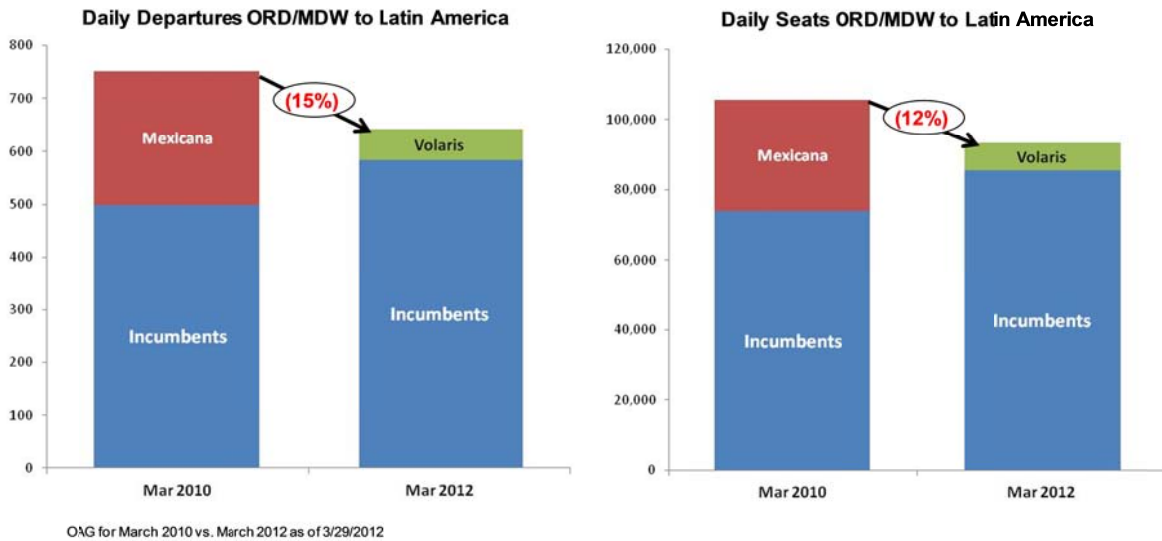


The HAS Hobby Study’s incorrect assertion that divided international service poses no threat to international growth appears, in large part, to be based on a flawed and overly simplistic observation of events at Chicago ORD following the entry of Mexican LCCs at Chicago-Midway (**MDW**). The HAS Hobby Study asserts that, “The entry of the Mexican carriers at MDW has **caused** American and United to increase their ORD departures by 29% and 46%, respectively, in March 2012 over March 2010.”<sup>35</sup> However, an analysis of the data reveals that the increase at ORD by American and United was caused by the carriers’ back-filling the capacity void left by the bankruptcy and subsequent exit of Mexicana, the largest Mexican carrier to the U.S.

<sup>35</sup> HAS Hobby Study, Page 18, emphasis added.

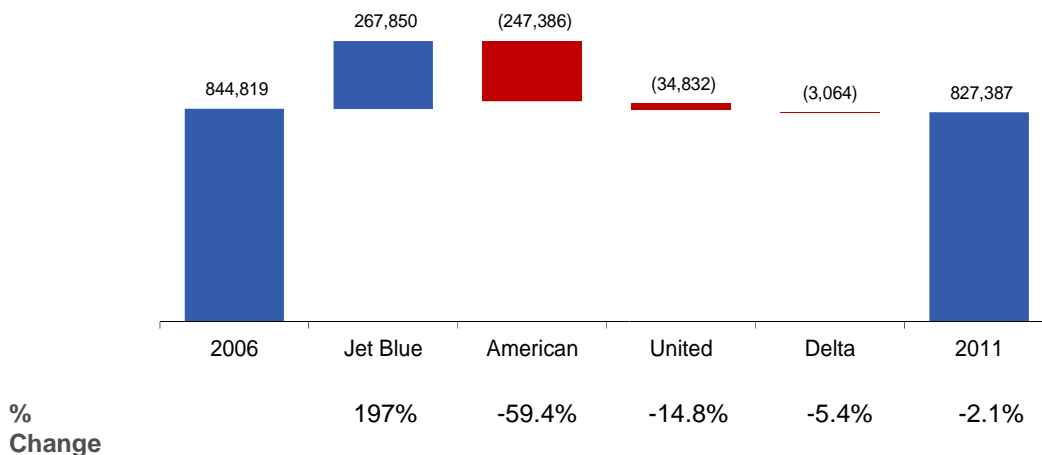


**Exhibit 20: United and American Latin America Service at ORD, March 2012 vs. March 2010**



Similarly, an analysis of the data from other analysis of other multi-airport metropolitan areas shows clearly that international expansion by LCCs does not stimulate incumbent carrier growth but rather, comes at the expense of incumbent carrier capacity. For example, Exhibit 21 demonstrates that, following JetBlue’s growth into Latin American markets at JFK in 2006, American, United, and Delta all reduced capacity on the overlapping routes, and, as a result, overall capacity on the 19 Latin American destinations served by JetBlue from JFK *actually declined* between 2006 and 2011.

**Exhibit 21: 2006 vs. 2011 Change in Overlapping EWR/JFK – Latin America Markets**



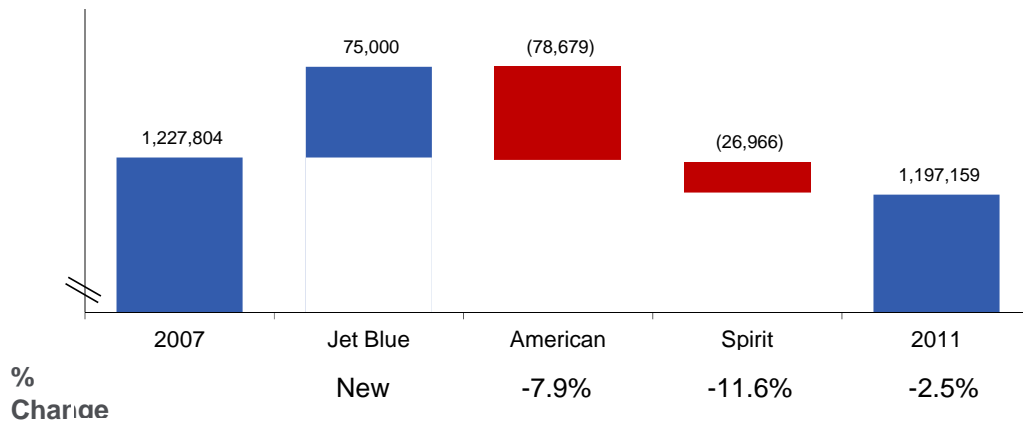
Source: OAG weekly seats for FY 2006-2011

Third, the HAS Hobby Study also grossly mischaracterizes the stimulative effect on incumbents’ capacity as a result of LCC entry in its description of service at Miami/Fort Lauderdale by suggesting that

## The Economic Impact of Dividing International Air Service between Houston Airports

American increased capacity at MIA as a result of entry by LCCs Spirit and JetBlue at FLL. Indeed, as shown in Exhibit 22, capacity between Miami/Fort Lauderdale and Latin America on routes overlapping with JetBlue and Spirit actually declined since the entry of JetBlue.

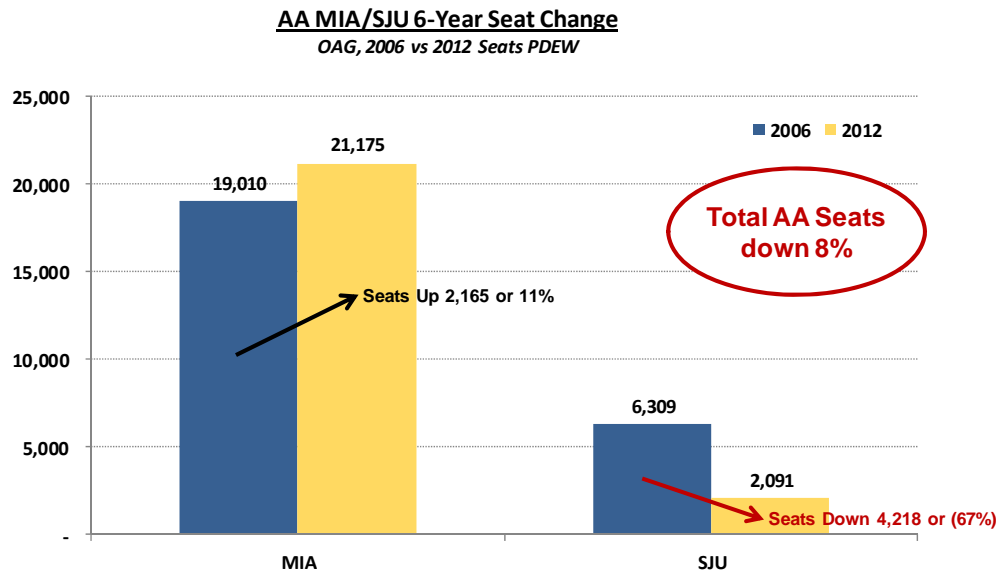
**Exhibit 22: 2007 vs. 2011 Capacity Change in Overlapping FLL/MIA – Latin Markets**



Source: OAG weekly seats for FY 2007-2011

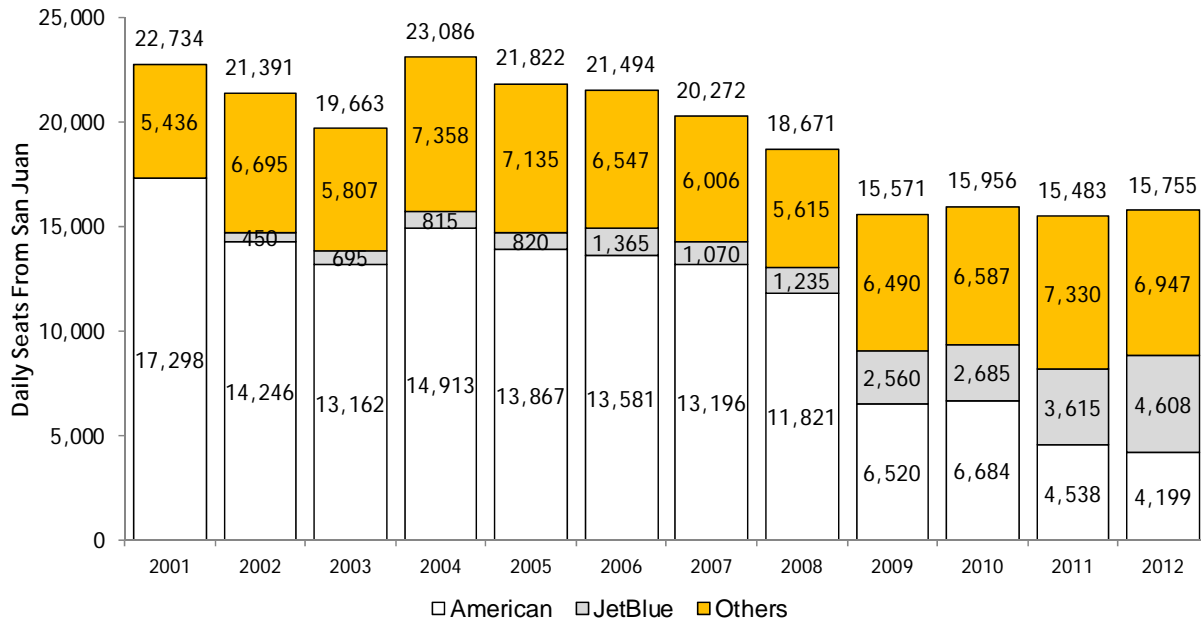
Further, while it is true that American has increased its Latin American capacity from MIA over the past six years, this was not caused by a stimulative effect of LCCs at nearby Fort Lauderdale, *but rather driven by American's closure of its San Juan hub*. As demonstrated in Exhibit 23, between 2006 and 2012 (when LCCs were expanding internationally out of Fort Lauderdale), American's overall Latin American Capacity from MIA and San Juan combined actually *fell by close to 8%*.

**Exhibit 23: Change in American Daily Seats, 2006 vs. 2012**



Indeed, the closure of American’s hub in San Juan provides the clearest example of the impact of LCC entry into a network carrier’s hub. Rather than stimulate American’s traffic, as the HAS Hobby Study implies should happen, American eventually closed its hub in San Juan. As Exhibit 24 illustrates, since 2002, the year of JetBlue’s entry into San Juan, total seats in San Juan are down by over 30%. Over the 10-year period, for every seat added by JetBlue, American has *removed approximately three seats* from San Juan.

**Exhibit 24: Total Seats San Juan, 2001-2012**



Source: OAG, June of each year.

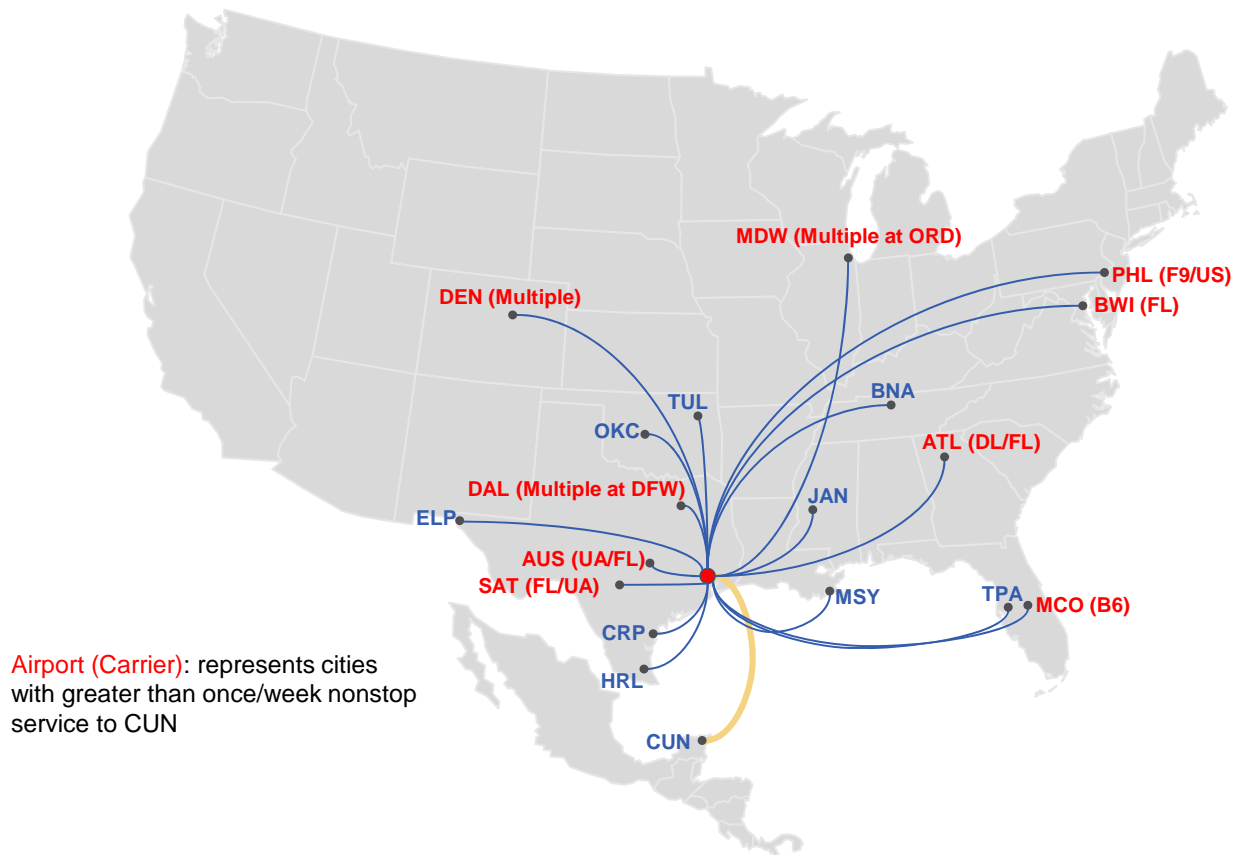
Finally, the HAS Hobby Study speculates that Southwest’s international expansion at Hobby would result in a high proportion of its passengers on those new services flowing over Hobby to and from other destinations the carrier serves. For Cancun, for example, the HAS Hobby Study projects that 62% of Southwest’s passengers would be connecting passengers, a proportion similar to United’s.<sup>36</sup> This assumption is unrealistic, as Southwest currently connects only 30% of its current Houston-Hobby passengers.<sup>37</sup> Further evidence of how aggressive this assumption is can be found in Exhibit 25, which demonstrates the fact that a well-timed flight to Cancun would offer connections to only 18 cities, half of which *already have non-stop service to Cancun*.<sup>38</sup>

<sup>36</sup> See HAS Hobby Study, Exhibit 1-13, which projects that Southwest’s Cancun service would result in 91,776 local and 148,908 connecting passengers.

<sup>37</sup> Source: Analysis of U.S. DOT DB1B data.

<sup>38</sup> Assumes Southwest’s Houston-to-Cancun flight departs at 10:05 AM and arrives at 11:25 AM and its Cancun-to-Houston flight departs at 12:25 arriving at 15:55. The average connecting time at HOU would be 3 hours and 11 minutes.

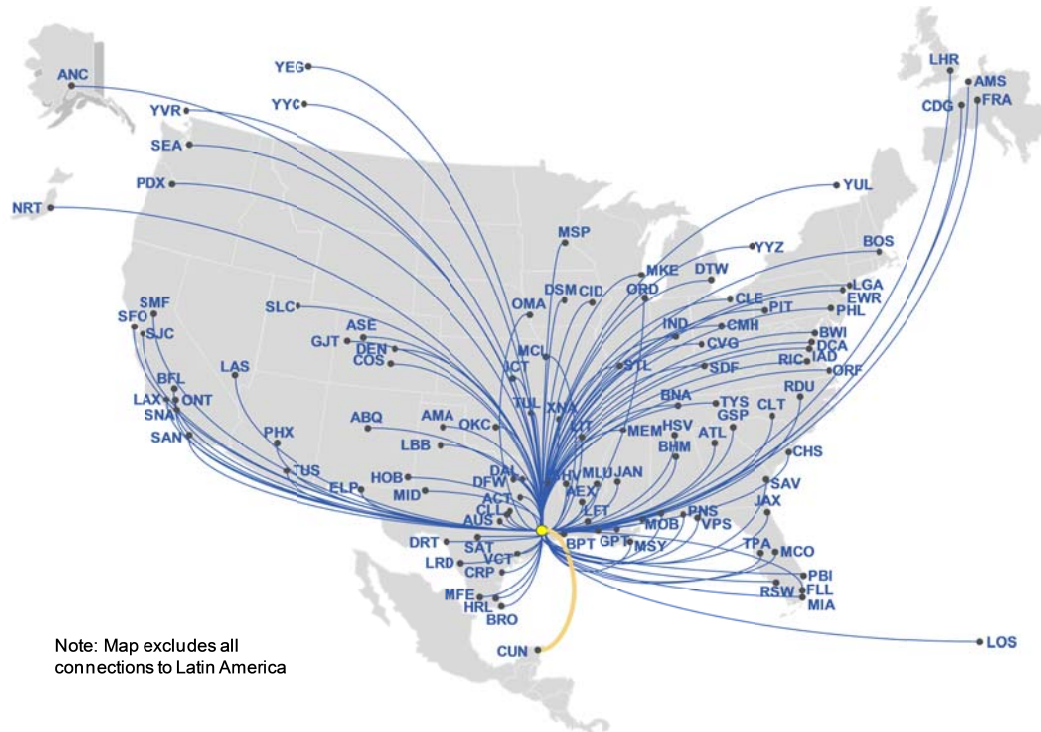
**Exhibit 25: A Well-Timed Southwest Flight from Houston Hobby to Cancun Would Connect to Only 18 Cities**



In order to generate the levels of connectivity assumed by the HAS Hobby Study, substantially greater numbers of connections are required. For example, approximately 75% of the passengers on United’s Houston-Cancun flights make a connection at IAH, but this level of connectivity is only possible because: 1) United offers connections to more than 100 domestic and international destinations, and 2) United offers six daily roundtrip flights providing the breadth of schedule options travelers value. Moreover, the average connect time at IAH is one hour and 49 minutes. Southwest’s theoretical schedule would result in longer connect times at Hobby versus United’s at IAH, resulting in no improvement to Houston’s competitive position in terms of connect times vis-à-vis DFW, ATL, and CLT.<sup>39</sup>

<sup>39</sup> Assumes a hypothetical schedule (timings not provided by HAS Hobby Study) operating at times reasonable for services of this nature. Southwest does not “bank” its HOU operation, resulting in inferior connect times at all times of day versus United’s “banked” operation at IAH.

**Exhibit 26: United's Cancun Services Connect to 111 Destinations in the U.S., Canada, Europe and Japan**



In summary, each of the assertions made by the HAS Hobby Study with regards to the stimulative effect that international service at Hobby would have on IAH are simply untrue and are unsupported by the data. Therefore, the HAS Hobby Study is not a reliable basis for making an informed policy decision with broad-ranging implications for the future of Houston as a global aviation hub, and, consequently, the well-being of the city's residents and the competitiveness of its businesses.

**d) Based on the Projected Fares in the HAS Hobby Study, Southwest Would Lose More Than \$75 Million and Have an Operating Margin of Approximately Negative 50% on the 11 Hypothetical Routes**

Not surprisingly, when one combines the unrealistically low projected Southwest fares in the HAS Hobby Study with the HAS Hobby Study's other assumptions (e.g., about load factor and capacity) and combines these assumptions with Southwest's publicly available cost data from 2011, the results show that Southwest would lose more than \$75 million annually from these operations and incur an operating margin of approximately -50% (see Appendix A).<sup>40</sup> Indeed, in order to simply break even on

<sup>40</sup> Southwest passenger revenues are grossed-up to include Southwest's ancillary revenue as reported by public sources. Southwest domestic costs are grossed-up by the ratio of United's domestic and international narrowbody mainline operational costs..

these 11 routes under the assumptions in the model contained in the HAS Hobby Study, Southwest would need to charge an average one-way fare of approximately \$175 (i.e., over 50% more than the \$112 average “projected fare” in the HAS Hobby Study). Further, if Southwest were to earn a modest 3% return on these flights, it would need to charge an average fare of \$187 (or 67% more than the average “projected fare” in the HAS Hobby Study). Notably, United’s average coach fare (including the pro-rated amount for connecting passengers traveling on these routes) is \$185. It is important to note that this forecasted loss is despite the unreasonable traffic stimulations assumed by the study.

In summary, the HAS Hobby Study’s projected fare decreases and traffic increases—that underpin the economic benefits—are clearly unreasonable. Not only are they inconsistent with the HAS Hobby Study’s own yield equations, they imply that Southwest would set fares at levels that would result in the carrier losing more than \$75 million annually from the operation of only 20 daily flights (a negative 50% operating margin). Simply put, the HAS Hobby Study’s projected fares and traffic levels—and thus economic benefits—are grossly overstated. In fact, traffic levels will decrease and not increase as the HAS Hobby Study claims.

#### **e) The HAS Hobby Study Ignores the Impact of Weakening IAH vis-à-vis Other Hubs as an International Gateway**

Based on its flawed fare-decrease analysis, the HAS Hobby Study concludes that there would be a net increase in traffic at IAH of more than 160,000 annual passengers in the “Initial Phase Scenario” and an increase of more than half a million passengers in the “Developed Phase Scenario.”<sup>41</sup> According to the HAS Hobby Study, the net increase in IAH passengers results from a combination of newly stimulated passengers because of the (erroneous) lower fares and a diversion of flow traffic to Latin America from other hubs (e.g., DFW, MIA, and ATL). As described in detail above, the hypothetical decrease in fares is grossly exaggerated. The other key flaw in the HAS Hobby Study’s results is the assumption that United would not decrease capacity and would be willing to endure losses in order to maintain marginal routes when higher return opportunities exist elsewhere in its network.

In contrast to the HAS Hobby Study, the United Study analyzes the effect of the projected new Southwest service using its ordinary course of business QSI-based passenger forecast model. This model, which United uses to plan and evaluate all of its network decisions, results in the common-sense finding that United would be forced to pare back its operations at IAH and re-allocate future growth opportunities to other hubs as a result of Southwest’s services, leading to a substantial decline in traffic at IAH, *and an overall decline in passenger volumes at Houston airports*. The difference in projected changes in passenger volumes between the HAS Hobby Study and the United Study is illustrated in Exhibit 32. As discussed, the HAS Hobby Study fails to account for the dozens of frequency reductions on United’s existing routes, the termination of service to several destinations, as well as the growth opportunities from IAH that United would be forced to forego. Thus, contrary to virtually all prior

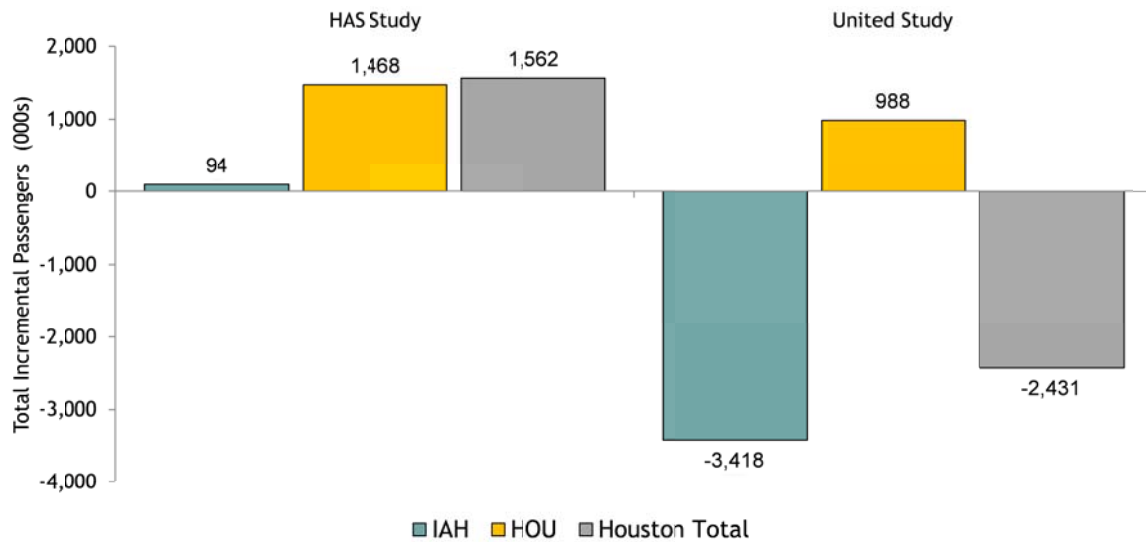
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<sup>41</sup> See HAS Hobby Study, Exhibits 2, 1-16, and 1-19.

## The Economic Impact of Dividing International Air Service between Houston Airports

evidence and logic regarding operations of network airlines, the HAS Hobby Study forecasts that net traffic levels actually will *increase at IAH*. In contrast, United’s ordinary course forecast and planning models predict that, as a result of reducing daily IAH flights by 46 and re-allocating several growth opportunities to other hubs in its network, IAH will see a net decline of more than three million annual passengers. As a result, Houston overall will experience a net reduction of more than two million annual passengers (see Appendix B for details).

**Exhibit 27: Estimated Impact of International Service at Hobby Airport on Passenger Traffic at Houston Airports**



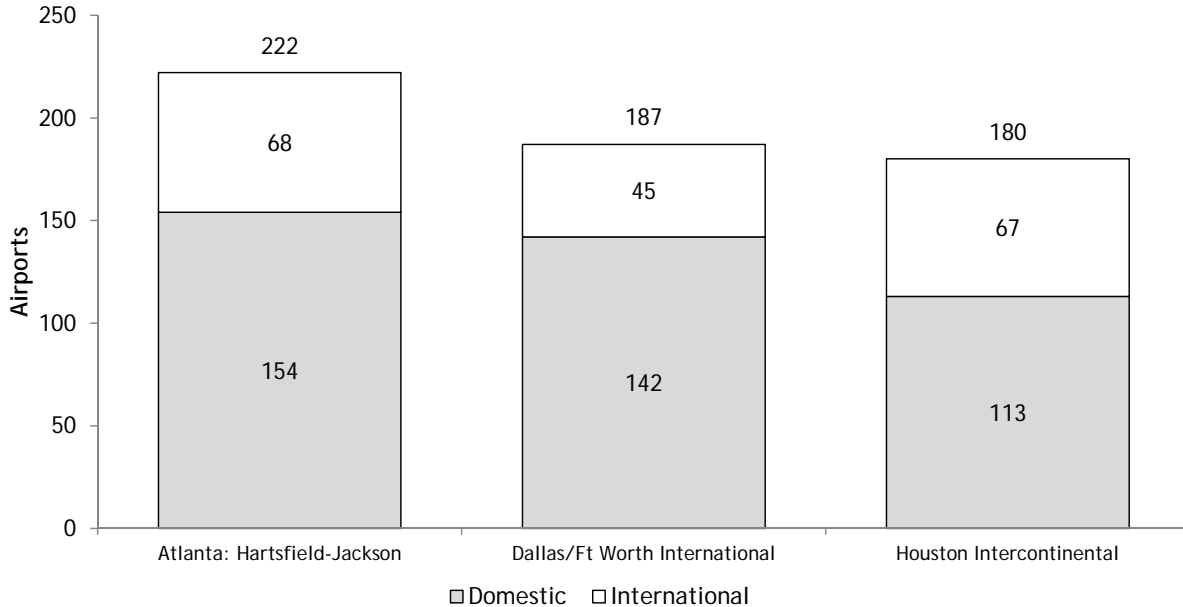
Source: “The Economic Impact of International Air Service at William P. Hobby Airport” Prepared for HAS by GRA, Incorporated and InterVISTAS Consulting LLC.

*Importantly, the HAS Hobby Study’s analysis has simply ignored how the consequences of weakening IAH as a hub would affect Houston’s residents and businesses.<sup>42</sup> Over the past two decades, Continental (and now United) has invested to develop IAH as a successful competing gateway relative to DFW and ATL. However, this position is tenuous given IAH’s smaller size and scope.*

<sup>42</sup> InterVISTAS has previously recognized the value of increasing the size of an airline’s network, and therefore implicitly the negative effect should it get smaller. They note that, “The studies described above demonstrate that air transportation plays an important role in business location decisions. Other studies have uncovered empirical evidence demonstrating a strong linkage between air service and economic development and investment.” In particular they note one study which “showed that expansion of the airline network serving a region had a significant positive impact on employment in that region.” InterVISTAS-ga<sup>2</sup> “The Economic Impact of Air Service Liberalization,” p. 87.



**Exhibit 28: IAH is Smaller than the Other Two Primary Alternate Hubs for Latin Service**



Source: OAG, June 2012.

IAH’s smaller size and scope is especially troubling considering the further growth being planned at DFW and ATL. As Mr. Diaz mentioned in his presentation, ATL has just opened a new 1.2-million-square-foot international facility. The new facility has 12 international gates and 40 CBP inspection stations and cost \$1.4 billion to build.<sup>43</sup> Additionally, as part of its restructuring plans, American has announced plans to add a substantial number of new destinations from its hubs, particularly to international destinations. Development of a competing international airport in Houston will only serve to further undermine IAH’s position as a premier international gateway. Further, while Southwest seeks to divide international air service in Houston, it agreed never to do so in its hometown of Dallas, by signing a contract with the Cities of Dallas and Fort Worth, DFW Airport, and American Airlines, that stated:

The Parties agree that non-stop international service to and from the Dallas-Fort Worth area shall be limited exclusively to DFW International Airport (“DFW Airport”). The Cities will jointly encourage all such flights into DFW Airport.<sup>44</sup>

<sup>43</sup> <http://www.11alive.com/news/article/238837/40/Inside-Hartsfield-Jackson->

<sup>44</sup> See “Contract Among the City of Dallas, The City of Fort Worth, Southwest Airlines Co., American Airlines, Inc., and DFW International Airport Board Incorporating the Substance of the Terms of the June 15, 2006 Joint Statement Between the Parties to Resolve the ‘Wright Amendment’ Issues,” July 11, 2006.

## 4) The HAS Hobby Study’s Economic Impact Analysis is Critically Flawed

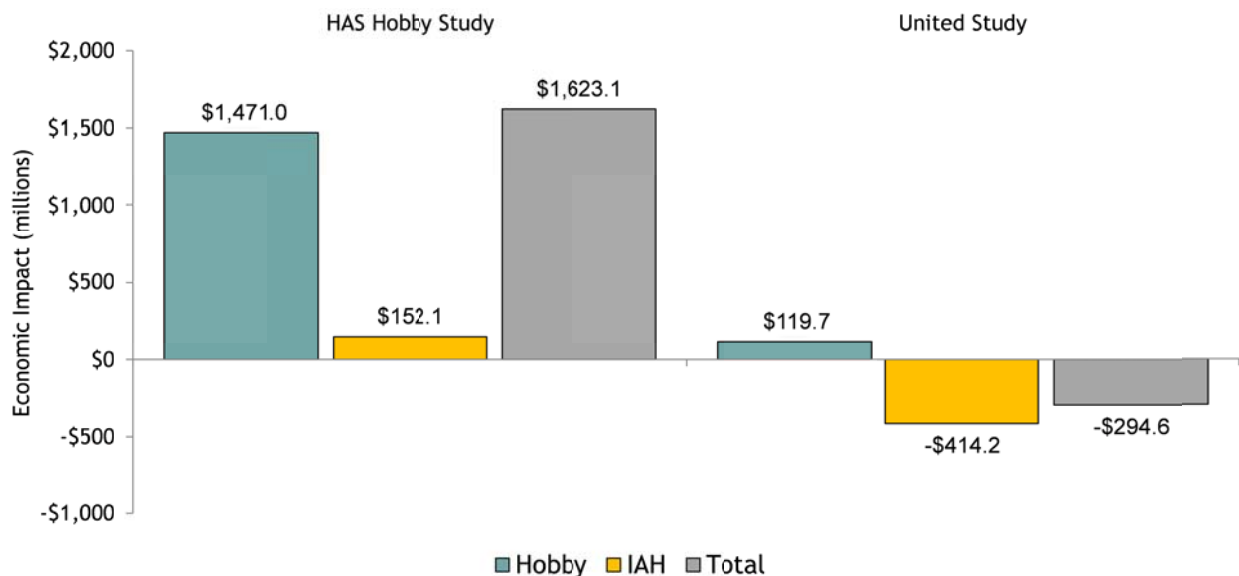
### a) Economic Impact Analysis

#### Overview

Dr. Smith, Professor Emeritus of the University of Houston’s Department of Economics, conducted an economic analysis of the Proposal for United (**Dr. Smith’s Analysis**). Dr. Smith is renowned for his intimate knowledge of the local Houston economy and has conducted impact studies for a wide range of public- and private-sector clients, and is well aware of pitfalls that often befall other regional economic-impact studies.

One of the objectives of the HAS Hobby Study is to estimate the regional economic impact of the proposed international flights from Hobby. The HAS Hobby Study purports to show that new international service at Hobby will lead to the creation of 18,111 jobs and \$1.6 billion in additional economic output for the City. For a variety of reasons, these estimated economic impacts are misleading and incorrect. As will be described in detail in this section, the estimation of regional economic impact is only as good as the model that is used and the inputs applied to the model. Dr. Smith has employed realistic assumptions provided by United based on the passenger forecast model it uses for its network planning, and has applied a nationally recognized model, to conclude that the Proposal would result in the loss of more than 5,000 jobs and \$414 million in GRP per year from IAH compared to a gain of only 1,500 jobs and \$120 million in GRP per year from Hobby, with a resulting net loss to the Houston economy of almost 3,700 jobs and \$295 million in GRP per year.

**Exhibit 29: Estimated Economic Impact of International Service at Hobby Airport**



Notes: The HAS Hobby Study’s estimated impact corresponds to the “Developed Phase Scenario” and represents “output”. The United Study’s estimated impact corresponds to the “Operating Phase” and represents “Value Added”.

## The Economic Impact of Dividing International Air Service between Houston Airports

The stark differences in the two studies' conclusions are a result of several differences in both the assumptions used and in the modeling employed. For example, while the HAS Hobby Study relies on (as inputs) grossly exaggerated passenger stimulation figures that are in turn the result of non-credible assumptions regarding the fares Southwest would charge, Dr. Smith's Analysis uses passenger levels that are estimated by United using United's ordinary course network planning tools. Likewise, the HAS Hobby study assumes changes in employment levels as a result of the additional services from HOU that are far in excess of current levels. Similarly, whereas the HAS Hobby study uses a measure known as "output," which significantly overstates the amount of economic impact that stays within the Houston area to describe the economic purported economic impact, Dr. Smith's Analysis correctly uses "total value added," (i.e., Gross Regional Product) which describes the economic impact that directly benefits the Houston area.

The remainder of this section describes how both the inputs and assumptions embedded in the HAS Hobby Study are critically flawed and why, in turn, the results of the HAS Hobby Study cannot be used as the basis for any critical policy decision regarding the future of Houston's status as a global aviation hub. Likewise, we demonstrate that the underlying data and assumptions used as inputs in the HAS Hobby Study analysis are also inconsistent with a previous study conducted by the very same consultants in 2011.

### ***The Primary Tool Used in Economic Impact Studies: Input-Output Analysis***

The HAS Hobby Study uses Input-Output (I-O) models to estimate economic impact. Dr. Smith does not challenge the use of I-O models as a legitimate tool in conducting economic impact studies; in fact the use of I-O models is the only acceptable methodology in both the academic and professional literature for this sort of regional analysis. There are several credible commercial I-O models available, including the model utilized in the HAS empirical analysis. However, these models need to be carefully applied by a competent regional economist with ample experience in conducting regional economic impact studies. There have been literally hundreds of impact studies produced over the years for a wide variety of public and private sector initiatives that have violated key requirements of a sound analysis. In general, the results of these flawed analyses are that they greatly exaggerate the purported economic impact of the project or initiative considered.

Dr. Smith's Analysis applies the *IMPLAN* I-O model in analyzing all of the various economic impacts associated with changes in Houston-area air traffic. Dr. Smith has conducted numerous studies using I-O models to analyze changes in the Houston economy associated with dozens of different types of proposed changes in public- and private-sector investment, as well as many associated with the presence of already existent facilities.<sup>45</sup> Such studies begin with a pre-packaged I-O model available from one of several national firms, all of which rely to some extent on the U.S. Department of Commerce's national I-O model, which is then adapted to the specifics of individual regions. All three of

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<sup>45</sup> His most recent study involved estimating the overall effect of the Houston Livestock Show and Rodeo.

the most well-known and most utilized models (IMPLAN, RIMS II, and REMI) imperfectly match every region in the country to its own peculiarities. The IMPLAN model was chosen for the Dr. Smith's Analysis because it is the easiest for an expert researcher to modestly adjust to meet the realities of the region to be analyzed. Of course, this requires that the analyst has a thorough understanding of the region's economy and economic structure.

### ***How Economic Impact is Measured: Direct, Indirect, and Induced Impacts***

Economic impact studies measure three types of impacts to a local economy to derive the total economic impact: 1) the initial ***direct economic effects*** on output and direct employment of any new business activity (or reduced business activity); 2) the ***indirect impacts*** from purchases required to produce the direct impacts, and 3) the ***induced impacts*** related to the spending of increased incomes as they circulate throughout the economy. The ***total economic impact*** is the sum of the direct, indirect, and induced impacts.

In this study, ***direct impacts*** arise from expenditures and employment directly associated with the airport itself, the airlines involved, and any local spending of the passengers they carry. ***Indirect impacts*** arise from expenditures that support this initial spending; for example, the purchase of jet fuel for the aircraft or the purchase of food by restaurants servicing new passengers.<sup>46</sup> Finally, ***induced impacts*** occur when the additional income from the direct and indirect impacts is re-spent on local goods and services (for example, the increased income of fuel-truck operators might be spent on local groceries, clothing or entertainment).<sup>47</sup>

## **b) Flaws in the HAS Hobby Study: Erroneous Inputs**

### ***Exaggerated Airline and Airport Job Effects at Hobby***

First, the HAS Hobby Study drastically overstates the incremental impact on airline- and airport-related employment from increased passenger traffic. That is, the number of additional airline and airport-related employees that would be added to support the increased traffic and service. The HAS Hobby Study states that the new flying at Hobby will create 2,931 new direct, "on airport" jobs at Hobby. As a point of reference, Southwest recently stated, in a March 13, 2012, letter to HAS Director Mr. Diaz, that

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<sup>46</sup> Note that passengers who are residents of Houston are not expected to create any direct or indirect effects since they are not bringing into the region additional outside dollars.

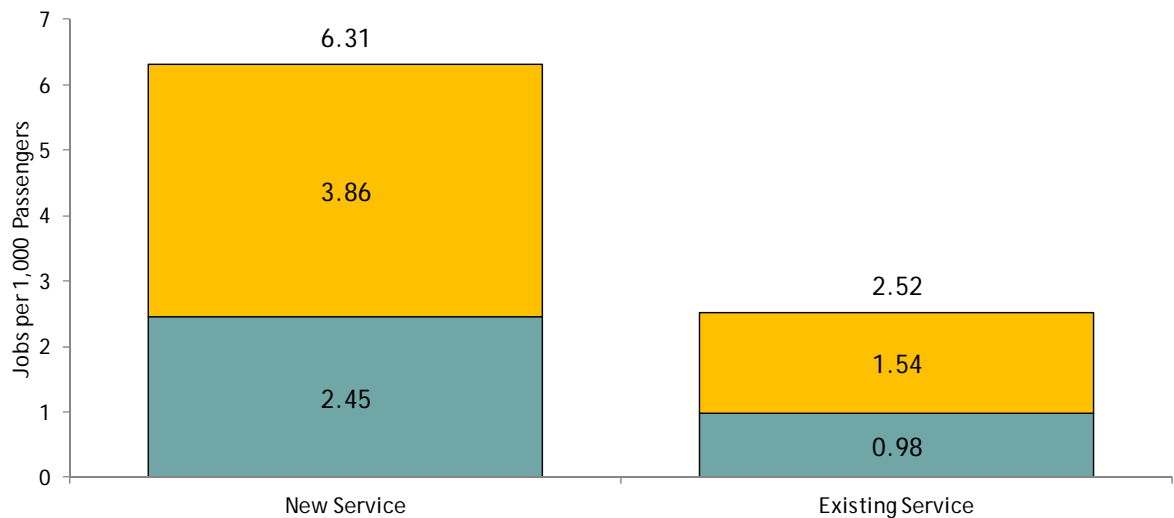
<sup>47</sup> For similar type studies see, for example, ATL, "Connecting the Region to the World, Final Technical Report, Economic Impact Study," 2005; "The Contribution of Bradley International Airport To Connecticut's Economy, State of Connecticut Economic Impact Analysis" May 27, 2005; "The Economic Impact of the Cincinnati/Northern Kentucky International Airport on Greater Cincinnati," prepared by the Economics Center for Education and Research, George M. Vredeveld, University of Cincinnati, May 2005.

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they currently operate “135 daily nonstop flights to 34 cities with 2,770 local employees.”<sup>48</sup> That same letter also states that “staffing a HOU CPB [sic] will require about 20 agents.”<sup>49</sup> It is difficult to reconcile how the 23 additional flights from Hobby Airport described in the HAS Hobby Study could possibly require more direct employment than Southwest’s entire current schedule, which is nearly six times larger.

In fact, the employment estimates in the HAS Hobby Study directly conflict with the assumptions of the HAS 2011 Study conducted by the very same consultants.<sup>50</sup> The HAS 2011 Study estimated that each 1,000 airline passengers at Hobby created 0.98 airline jobs and 1.54 other airport jobs for a total of 2.52 airline-related jobs (see Exhibit 30). The HAS Hobby Study projects that, for each 1,000 new passengers at Hobby, an additional 2.45 airline jobs and 3.86 other airport jobs (for total of 6.31 airline-related jobs) would be created to support the new service. In other words, the current HAS Hobby Study implies, for no apparent reason, that the new service creates more than double the number of employees as does the existing service.

**Exhibit 30: GRA’s Estimated Job Impacts per Passenger are Inconsistent with the HAS 2011 Study**



■ Airline Jobs Per 1,000 Passengers at Hobby ■ Other Airport Jobs Per 1,000 Passengers at Hobby

Source: “The Economic Impact of International Air Service at William P. Hobby Airport” Prepared for HAS by GRA, Incorporated and InterVISTAS Consulting LLC.; “Houston Airport System Economic Impact Study,” prepared by GRA, Incorporated, June 30, 2011; U.S. BTS.

Notes: Passengers are the sum of arriving and departing passengers. Other airport jobs include airport passenger services, passenger ground transportation, and airport and aircraft services. The HAS study’s estimated impact on employment corresponds to the “Developed Phase Scenario.” The United study’s estimated impact on employment corresponds to the “Operating Phase.”

<sup>48</sup> See Letter from Bob Montgomery to Mario Diaz, March 13, 2012, page 4.

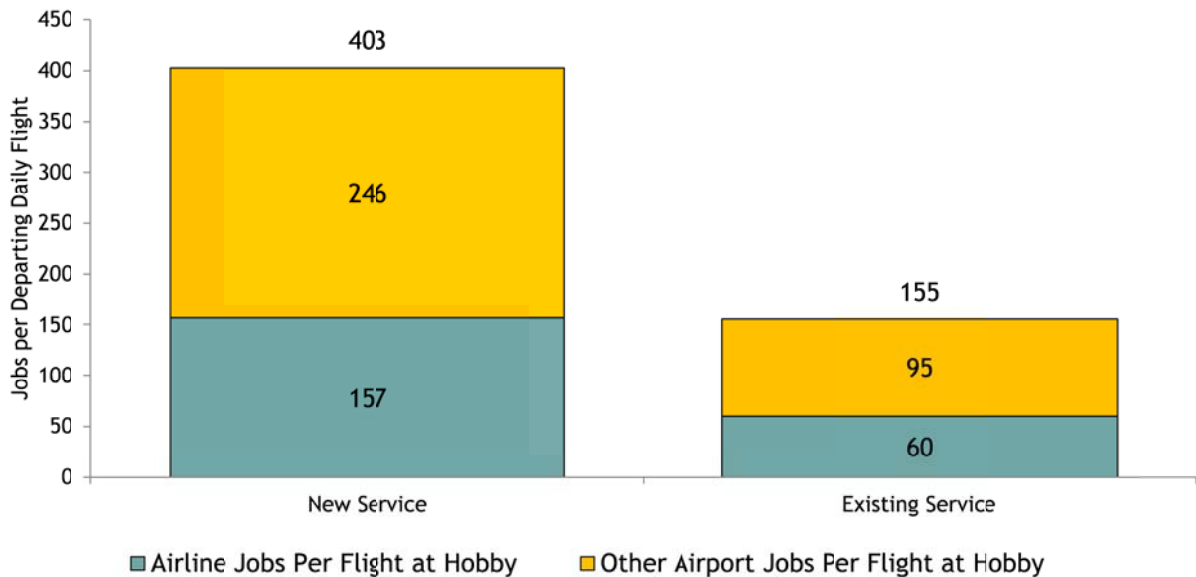
<sup>49</sup> Ibid, page 2.

<sup>50</sup> “Houston Airport System Economic Impact Study,” prepared by GRA, Incorporated, June 30, 2011.

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The exaggerated impacts are also seen if one considers the incremental job impacts on a per-daily-flight basis. For example, Exhibit 31 shows that the 2011 study estimated that each Hobby daily flight was responsible for approximately 60 airline jobs and 95 other airport-related jobs for a total of 155 jobs per daily flight at Hobby.<sup>51</sup> The HAS Hobby Study, however, finds that the 23 additional flights will create a total of 403 airline- and airport-related jobs per daily flight, or more than 2.5 times than for the existing service.<sup>52</sup> In contrast to these inflated job growth assumptions, Dr. Smith’s Analysis assumes direct employment growth at Hobby of 892 jobs, which is consistent with an approximate 10-15% increase in flights per day from Hobby, as compared to current Hobby Airport direct employment.

**Exhibit 31: The HAS Hobby Study’s Estimated Job Impacts per New Flight are Inconsistent with the HAS 2011 Study**



Source: “The Economic Impact of International Air Service at William P. Hobby Airport” Prepared for HAS by GRA, Incorporated and InterVISTAS Consulting LLC. ; “Houston Airport System Economic Impact Study,” prepared by GRA, Incorporated, June 30, 2011; U.S. BTS.

Notes: Other airport jobs include airport passenger services, passenger ground transportation, and airport and aircraft services. The HAS study’s estimated impact on employment corresponds to the “Developed Phase Scenario.” The United study’s estimated impact on employment corresponds to the “Operating Phase.”

<sup>51</sup> It is important to note that the HAS Hobby Study assumes that the additional 23 flights would be operated by the same aircraft type (i.e., the Boeing 737) that Southwest uses on all of its current flights from Houston-Hobby, and would thus require the same crew complements.

<sup>52</sup> While it is true that international traffic may require more airport employees than domestic traffic, the more than two-fold difference is entirely unrealistic.

### ***Reliance on Exaggerated Passenger Stimulation Numbers***

The HAS Hobby Study's inflated economic impact analysis is compounded by a second critical flaw, in that it relies on projected changes in passenger traffic that are entirely unrealistic. The changes in passenger volume projected by the HAS Hobby Study are based on overstated fare reductions, resulting in greatly exaggerated estimates of net additional trips that will be generated by opening up Hobby to international flights. Further, because the resulting increase in demand is estimated to be so large, the study comes to the erroneous conclusion that United would not be forced to reduce capacity at IAH in response to expanded service by Southwest at Hobby. Indeed, the HAS Hobby Study comes to the illogical conclusion that both Houston-area airports will experience growth in traffic volumes as a result of dividing international service at Houston — all to destinations already currently served from IAH.

Dr. Smith's Analysis begins with changes in passenger volume that are based on United's ordinary course of business QSI-based passenger forecast model. As discussed in Section 3 above, this model, which United uses to plan and evaluate all of its network decisions, results in the common-sense finding that traffic at IAH would be diminished in response to the new Hobby international service. United would be forced to pare back its operations at IAH and re-allocate future growth opportunities to other hubs in the United network as a result of the Proposal, leading to a substantial decline in traffic at IAH and an overall decline in passenger volumes at Houston airports collectively. This overall reduction in total passenger volume is combined with United's estimates (based on its own experience and an analysis of publicly available data) of airline operations to predict the incremental changes in airline and airport employment resulting from the changed traffic levels at each Houston airport. These more realistic estimates become important key inputs in Dr. Smith's IMPLAN I-O model. Furthermore, it is important to note that, in formulating the economic impact analysis, several conservative assumptions were made so as to not overstate the magnitude of the conclusion that new international service at Hobby actually would have a negative impact on the Houston economy.<sup>53</sup>

Exhibit 29 shows the difference in projected changes in passenger volumes between the HAS Hobby Study and the United Study. As discussed, the HAS Hobby Study fails to account for the dozens of reductions on United's existing routes, the termination of service to several destinations, as well as the growth opportunities from IAH that United will now be forced to forego. These routes all involve flights from Houston that were dependent upon connecting flight demand emanating from travel to and from Latin America. The failure to account for these reductions leads the HAS Hobby Study to incorrectly forecast that net traffic levels will actually *increase* at IAH, contrary to virtually all previous evidence and basic logic of how network airlines operate. In contrast, United's ordinary course forecast and planning models predict that, as a result of being forced to reduce daily IAH flights by 46 and of re-allocating several growth opportunities to other hubs in its network, IAH would experience a net decline of over

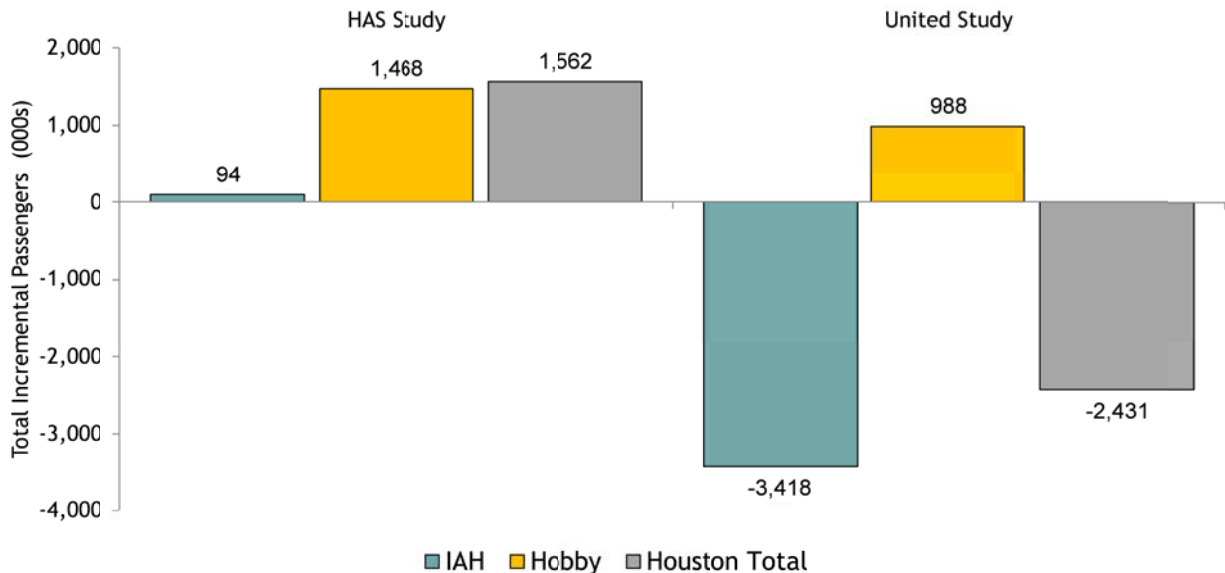
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<sup>53</sup> For example, it was assumed that all of the forgone passengers generated low (i.e., tourist-level) spending and that there will be no incremental changes in high-level management at the airports as a result of the service reductions at IAH. It was also assumed the resident travelers do not generate any new local expenditures that regional economists would classify as "import substitution" stimuli. Dr. Smith's Analysis also assumes that the facilities at Hobby will be completed in one year and that, by year three, Southwest Airlines will have fully achieved its expected passenger trip forecast, both of which are generous to the Hobby results.

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3.0 million annual passengers, leaving the overall Houston market with a net reduction of more than 2.0 million annual passengers. Note that at Hobby, the HAS Hobby Study and the United Study both project sizable increases in passenger volume, 1.5 and 1.0 million annual passengers respectively.<sup>54</sup> With respect to annual passengers, the biggest difference in the inputs to the I-O models involves estimates regarding annual passengers at IAH.

**Exhibit 32: Estimated Impact of International Service at Hobby Airport on Passenger Traffic at Houston Airports**



Sources: United Airlines; “The Economic Impact of International Air Service at William P. Hobby Airport” Prepared for HASby GRA, Incorporated and InterVISTAS Consulting LLC.

The HAS Hobby Study’s incorrect projections about future Houston airport traffic, combined with its unrealistic and inconsistent assumptions regarding the incremental employment required to support that traffic, lead to wildly exaggerated total economic impact estimates.

### **c) Flaws in the HAS Hobby Study: Improper Use of Economic “Output” (i.e., Sales) vs. Value-Added (i.e., Regional GDP)**

The differences in inputs to the I-O model analyses only explain a portion of the overall difference between the economic impact conclusions of the HAS Hobby Study and Dr. Smith’s Analysis. Not only are the assumptions utilized in the HAS Hobby Study grossly exaggerated, but the HAS Hobby Study’s

<sup>54</sup> As discussed above, this is despite Southwest losing money under either of these forecasts.



## The Economic Impact of Dividing International Air Service between Houston Airports

improper use of “Output” (i.e., sales) rather than Value-Added (i.e., regional GDP) inflates even further the HAS Hobby Study results.

When conducting I-O analysis, the analyst must select the correct measure of an overall economic impact within a region. The HAS Hobby Study’s I-O model results are reported in terms of regional economic “output.” Although estimates of regional output are reported in most available I-O models, this statistic is highly misleading. This is because the term “output” in these models in effect refers to “sales.” As such, output is a measure of total gross receipts, or sales, at each point of transaction and is inappropriate as a reliable measure of a policy’s potential economic impact on a region. For example, the “output” measure applied to the price of a loaf of bread includes not only the sale of the bread by the grocery store to its customers, it also includes the sale of the same bread to the grocery store by the local wholesaler and the sale of the same bread to the wholesaler by the bakery. Indeed, most I-O model manuals available to analysts remind the researcher that output is really regional sales and the use of such measure involves double counting.<sup>55</sup>

For some products, the chain of purchases is even more convoluted. For example, airlines purchase jet fuel from a supplier who purchases from a wholesaler/deliverer who purchases it from a producer who purchases all the required raw inputs to produce the fuel and so forth. Therefore, output measures the total sales price for each transaction, not the value-added created at each individual firm. Indeed, total value added is the correct measure to use in estimating the economic impacts upon a region and is equivalent to what regional economists call “Gross Regional Product” (similar to Gross Domestic Product at the national level). The use of output as a measure of regional economic impacts can easily imply effects that are two to four times greater than what actually occurs. “Total value added” eliminates double counting and captures only the economic impact of the activity which is actually conducted in Houston and is therefore the variable of choice in reporting economic impact.

The results of Dr. Smith’s Analysis are stated in terms of total value added, but also in terms of output to afford the reader an apples-to-apples comparison with the HAS Hobby Study (which only provides estimates in terms of output). However, the key point here is that value added is the appropriate measure of economic activity when evaluating public policies. It would seem that the HAS Hobby Study’s focus on output as a measure of economic activity is used to inflate the magnitude of its estimated positive economic impact — again, an impact which is positive only because of the exaggerated projected increase in passenger volumes at both Hobby and IAH airports.

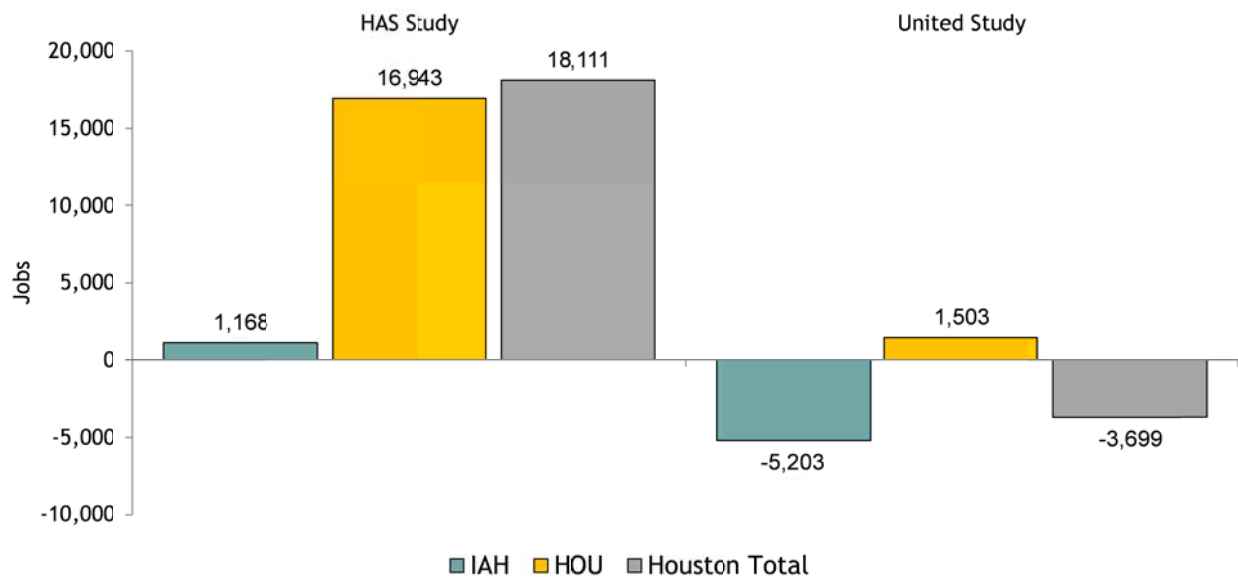
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<sup>55</sup> See, for example, *The Double Counting of Output*, IMPLAN, noting that, “The output of an industry requires output of other industries so output is double counted. Analysts will focus on output because those numbers are bigger than value added and income. But, while output is a measure of economic activity, as an indicator it can be meaningless.”

**d) The Differences in the Results of the HAS and the United Studies**

The exaggeration of the overall HAS Hobby Study’s results is particularly evident when one compares the estimated total employment impact associated with the new services at Hobby in the two studies. The HAS Hobby Study attributes 16,943 new regional jobs to the 1.5 million additional passengers it projects at Hobby alone, while the United Study attributes 1,503 new regional jobs to the 1.0 million additional Hobby passengers it projects. The huge difference in jobs created is due to the HAS Hobby Study using excessively optimistic assumptions regarding the long-run, steady-state level of new passengers at Hobby and wildly exaggerated impacts of new flights on employment that are far higher than what the HAS 2011 Study relied upon (as shown in Exhibit 30 and Exhibit 31 above).

**Exhibit 33: Estimated Impact of International Service at Hobby Airport on Employment**

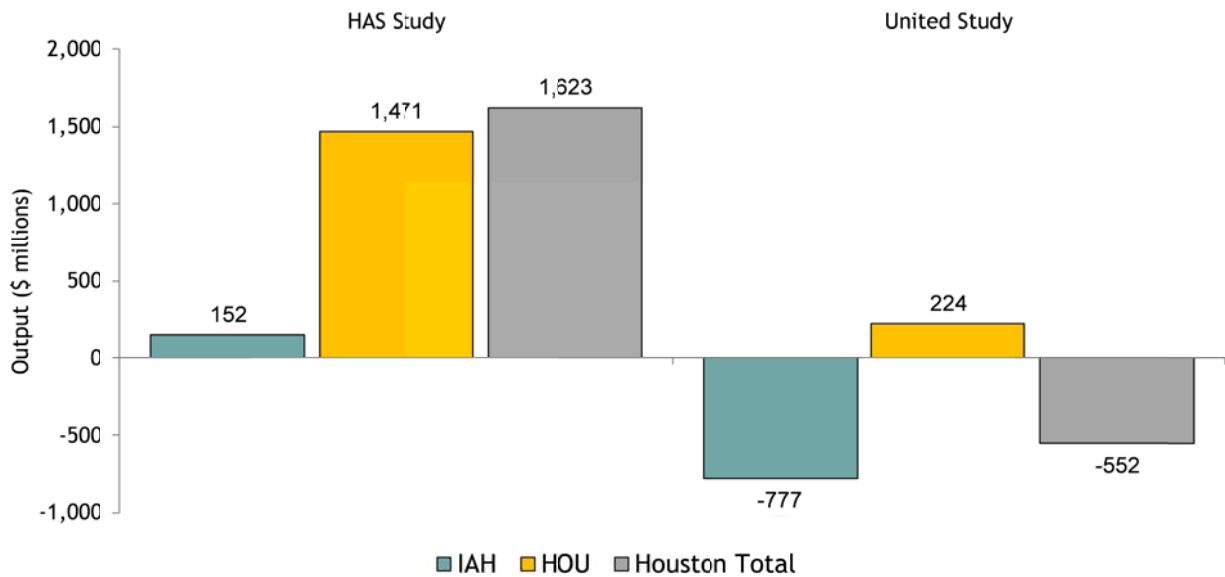


Source: “The Economic Impact of International Air Service at William P. Hobby Airport” Prepared for HAS by GRA, Incorporated and InterVISTAS Consulting LLC.  
 Notes: The HAS study’s estimated impact on employment corresponds to the “Developed Phase Scenario.” The United study’s estimated impact on employment corresponds to the “Operating Phase.”

Likewise, as shown in Exhibit 34, the HAS Hobby Study attributes approximately \$1.5 billion in additional “output” as a result of its projected 1.5 million additional passengers at Hobby, while the United Study estimates that the 1.0 million additional Hobby passengers it is projecting would create approximately \$0.2 billion in additional output.<sup>56</sup>

<sup>56</sup> Again, the HAS Hobby Study’s estimated of total output impact is inconsistent with the HAS 2011 Study. In particular, the HAS 2011 Study found that that Houston airports drive about \$28 billion in economic benefits to Houston, which equates to approximately \$195 million per gate. In the current HAS Hobby Study, however, the purported economic benefit is \$325 million per gate, two-thirds higher than in the HAS 2011 Study.

**Exhibit 34: Estimated Impact of International Service at Hobby Airport on Output<sup>57</sup>**



Source: “The Economic Impact of International Air Service at William P. Hobby Airport” Prepared for HAS by GRA, Incorporated and InterVISTAS Consulting LLC.  
 Notes: The HAS study’s estimated impact corresponds to the “Developed Phase Scenario.” The United study’s estimated impact corresponds to the “Operating Phase.”

Of course, since United’s expectation is that the impact on IAH will be negative, the results regarding the overall difference in the net effect upon the Houston economy is even more dramatic. As shown in Exhibit 34, rather than increasing *output* by over \$1.6 billion per year as the HAS Hobby Study claims, the United Study shows a net reduction in Houston regional *output* of \$552 million per year.<sup>58</sup> Similarly, as shown in Exhibit 33 above, instead of a net gain to Houston of 18,111 new jobs within the region, Dr. Smith’s Analysis shows a reduction in overall regional jobs of 3,699.<sup>59</sup>

Finally, it is important to stress that the economic impact figures proffered by the HAS Hobby Study are even further exaggerated by using “output” as the measure of economic activity. As noted earlier, the use of “output” double counts economic activity, and thus by definition leads to overstated results (either positive or negative). When the appropriate *value-added* measure (real gross regional product) is used, the United Study shows a decline of \$295 million dollars per year (versus \$552 million decline in overall Houston *output*).<sup>60</sup>

<sup>57</sup> Exhibit 34 shows “output” for both the HAS Hobby Study and the United Study in order to compare the two studies’ results on an apples-to-apples basis. As described below, the correct measure of economic activity is “value-added”, rather than “output”..

<sup>58</sup> See footnote 57.

<sup>59</sup> Dr. Smith also separates out his empirical results into the expected impact during 3 distinct phases: Year 1; Years 2-3; and Years 4-10. The results above apply, as does the HAS Hobby Study, to the steady-state equilibrium impacts on the Houston economy during the latter years. See Appendix C.

<sup>60</sup> Unfortunately, the HAS Hobby Study doesn’t provide this statistic, but given the HAS Hobby Study result that “output” increased by \$1.6 billion, its value-added equivalent would most likely be in the area of \$860 million.

### **e) Conclusions Regarding the HAS Hobby Study I-O Analysis**

In summary, the HAS Hobby Study portrays an entirely inaccurate impact of the Proposal on the Houston economy because it assumes highly inaccurate changes in net overall regional passengers trips per year, which are inflated by its untenable assumptions regarding the direct jobs associated with each trip. The impact is exaggerated further by reporting their results only in terms of output rather than value-added (gross regional product). With this many compounding errors, it would be irresponsible to rely upon the HAS Hobby Study's results to make such an important decision regarding Houston's future. In contrast, Dr. Smith's Analysis is based on inputs derived from United's ordinary course planning tools and benefits from his many years of expertise regarding the local Houston economy. As such, unlike the HAS Hobby Study, the United Study results in credible projections regarding the likely impact of the proposed Hobby expansion on Houston's economy.

## **5) All Hobby Passengers – Not Southwest – Will Pay for the Proposal**

### **a) Contrary to its Public Statements, Southwest Will Not Fund this Project, the Houston Airport System and Hobby Passengers Will**

Prior Airport Directors for the Houston Airport System encouraged a funding model through which airlines that benefited from terminal development also assumed a portion of the financial burden. Perhaps the most relevant example is the redevelopment of Terminal B at IAH, to which United is contributing \$97 million of its own corporate funds while the City is contributing \$53 million in funds from a PFC, which the airport collects from passengers using the terminal. This results in United paying \$2 for every \$1 of investment by the City. This method of financing, where the beneficiary of the facility shares in the financial risk, aligns the interests of the airport and the airline. This is not the case for the new International Concourse and FIS (Hobby FIS facility), where *Southwest proposes to contribute \$0 of the \$100 million investment.*

In the April 4 *Houston Chronicle*, a Southwest senior executive was quoted as saying, "We're asking for an opportunity to invest \$100 million in a new building in your city to provide more passengers..." The facts, as stated in Director Diaz's April 9th memo, show that Southwest *is not investing a single dollar* in the Hobby FIS facility. In fact, it is the City, through HAS, and not Southwest, that would be paying for the new Hobby FIS facility. As described by Mr. Diaz, the cost of constructing the new facility would be funded by a 50% increase of the PFC at Hobby Airport, from \$3 to \$4.50 per passenger, which is paid directly by the traveling public and used at the discretion of the airport. These PFCs would not only be paid by Southwest passengers, but also by passengers on American, Delta, and all other carriers that

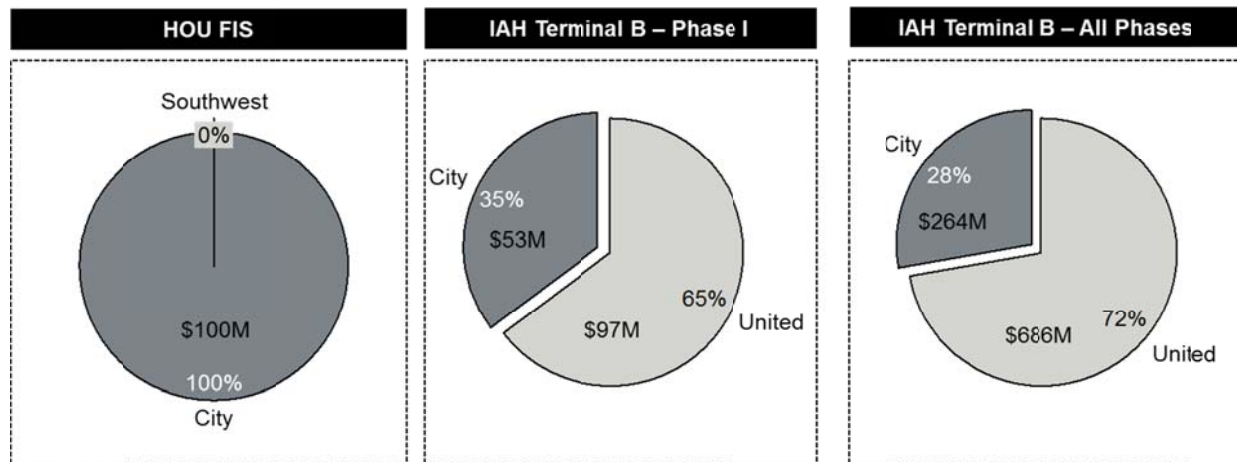
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Even this impact upon the region is, of course, biased significantly upward by the unreasonable assumptions that enter the HAS Hobby Study I-O model to begin with.

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serve the airport, *whether they use the facility or not*. Assuming the current traffic patterns continue, the funding of the principal component of this project, not the interest expense, would commit 100% of the available PFC revenue at Hobby Airport through at least 2020 — and likely longer — with no investment by Southwest.

**Exhibit 35: Southwest Contribution to the Hobby FIS Compared to United’s Contribution to IAH Terminal B**



Additionally, Mr. Diaz stated that HAS, and not Southwest, also would be responsible for funding a new automobile parking garage and improved roadways.<sup>61</sup> While he did not estimate the costs of the parking garage and roadway improvements in the memo, Mr. Diaz again stated that HAS would assume the cost and therefore the risk for these projects.

Adding further financial risk to HAS is the fact that the airport leases at Hobby expire on June 30, 2015. Assuming a three-year construction schedule as described by Mr. Diaz, this is approximately the same time that the Hobby FIS facility would be complete. Southwest has made no apparent commitment to serve Hobby past 2015, nor has Southwest made any commitment to repay the City in the event it chooses either to underutilize the FIS or not to provide any international service whatsoever in 2015.

Currently both IAH and Hobby Airport passengers pay a \$3 PFC. This is a \$1.50 per passenger cost advantage when compared to other large and medium airports that charge \$4.50 per passenger. This PFC differential is a competitive advantage to the Houston Airports as price-sensitive passengers who have the choice to connect over multiple airports will choose the less expensive option. As a point of reference, connecting passengers make up 52% of passengers at Intercontinental and 24% of passengers at Hobby. The HAS Hobby Study has not discounted from its passenger increase and overall economic benefit the impact of this increase in passenger cost. In fact, a 1999 study by the General Accounting Office found “that for a \$1 increase in the PFC, passenger reductions would range from 0.5% to 1.8% (and have a midrange estimate of 0.85%) and would be proportionally greater for nonbusiness

<sup>61</sup> Both termed “enabling” projects, which also means “required.”

passengers, low-fare airlines, large airports, and passengers taking relatively short flights.”<sup>62</sup> Given that Mr. Diaz is proposing a \$1.50 increase (50% more than the increase studied by the GAO), and the proposed flights to be added by Southwest would predominantly carry non-business passengers on relatively short flights, it is not unreasonable to fear the upper bound in passenger loss across the entirety of the Hobby airport traffic base, which is more than 175,000 passengers per year. The HAS Hobby Study completely ignores this impact of increasing the PFC.

Finally, the higher PFCs and debt would come at a time when IAH is capable of accommodating all demand for international service in Houston. The international Terminal D has 12 international gates for use by global carriers other than United, and those carriers currently provide a total of 12 flights on an average day.

## **6) Custom and Border Protection Impacts**

### **a) A New Mandate to Staff a CBP Inspection Facility for Commercial Traffic at Hobby Could Result in CBP Service Degradation at IAH and Other CBP Ports of Entry in Texas**

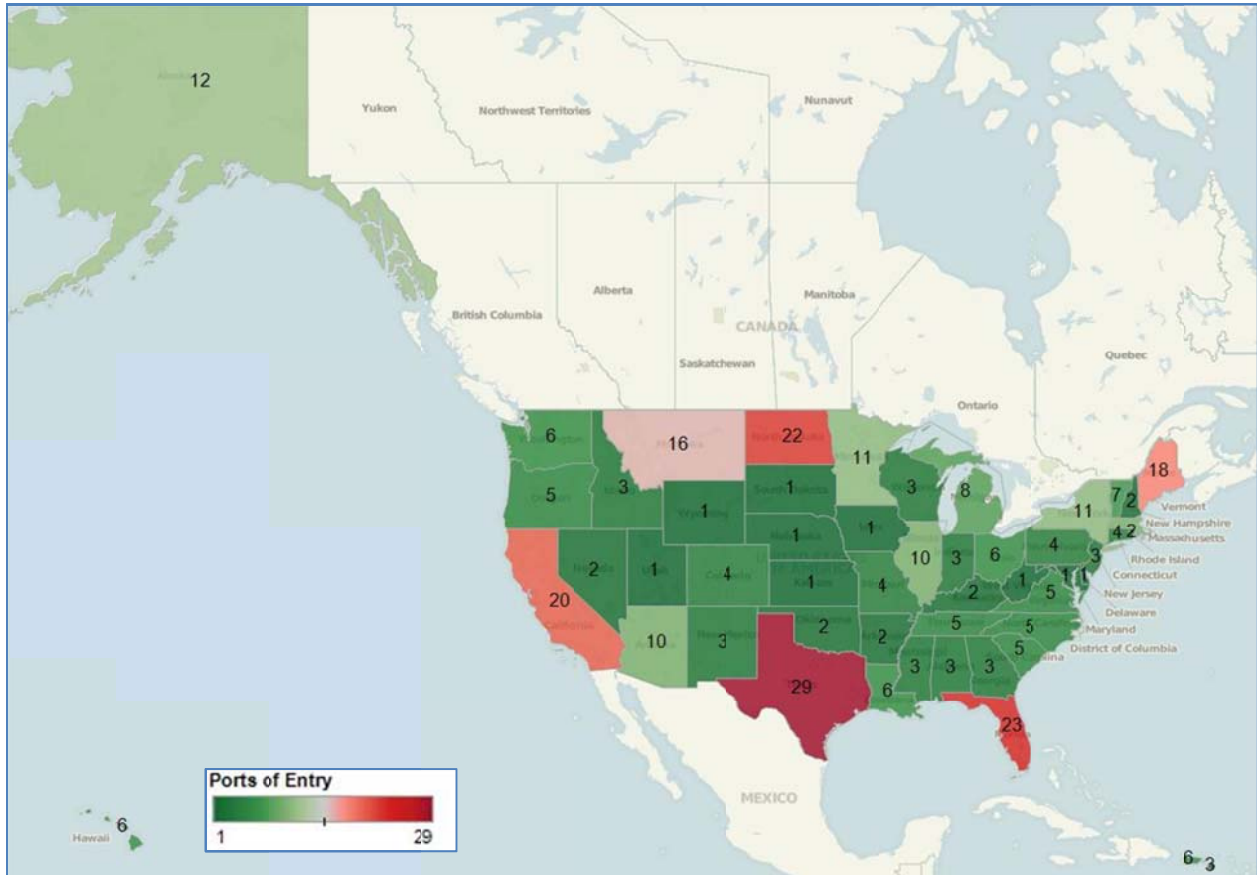
CBP is the federal agency responsible for securing the nation’s borders and protecting the public against terrorism. Its officers inspect and process thousands of passengers and containers at air, land, and maritime ports in the Houston region and throughout the State of Texas every day with no margin for error.

Due to its geographic location and the essential national security role it plays, Texas has the highest number of CBP ports of entry of any state (*see Exhibit 36*). These ports of entry are assigned to three CBP Field Operations Offices for oversight. In addition to IAH, the Houston field office is responsible for 18 ports of entry, including DFW (*see Exhibit 37*). Adding an additional Port of Entry at Hobby to CBP’s existing burden in the Houston region would place additional strain on already limited resources.

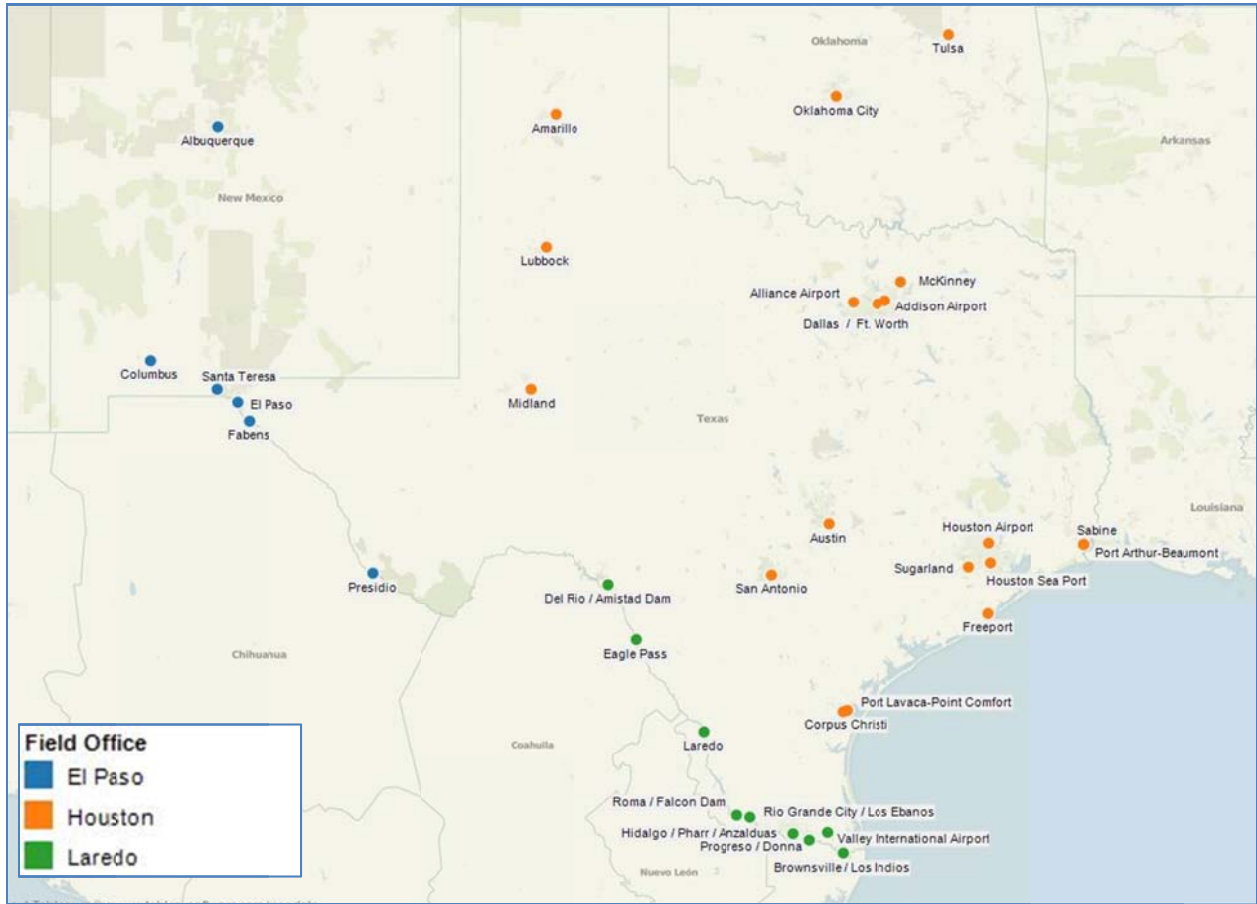
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<sup>62</sup> United State General Accounting Office, “Passenger Facility Changes: Program Implementation and the Potential Effects of Proposed Changes,” May 1999, p.44.

**Exhibit 36: CBP Ports of Entry by State**



**Exhibit 37: Texas Ports of Entry by Field Office**





**b) CBP Passenger Wait Times at IAH are Already Significantly Longer than the National Average and those at Competing Airports, Especially at Peak Times**

As shown in Exhibit 38, based on CBP’s statistics, in recent years IAH’s ranking in average CBP wait times (passenger-weighted) has dropped from among the best in 2006 to near the bottom in 2011.

**Exhibit 38: CBP Wait Time Ranking**

Rank	2006	2007	2008	2009	2010	2011
1	SJU	SJU	FLL	SJU	SJU	SJU
2	EWR	CVG	SEA	SEA	SEA	SEA
3	<b>IAH</b>	<b>IAH</b>	DFW	PHL	FLL	IAD
4	CVG	EWR	PHL	FLL	CVG	CVG
5	DTW	SFO	SJU	DFW	PHL	FLL
6	LAX	DTW	MCO	IAD	DFW	MSP
7	SFO	MSP	LAS	DTW	BOS	HNL
8	HNL	LAX	BOS	CVG	MSP	DFW
9	ORD	ORD	CVG	LAS	IAD	ATL
10	ONT	IAD	DTW	BOS	LAS	BOS
11	MSP	HNL	<b>IAH</b>	MSP	ATL	PHL
12	ATL	MIA	IAD	MCO	DTW	LAS
13	IAD	ATL	SFB	LAX	EWR	SFO
14	MIA	ONT	MSP	ORD	HNL	EWR
15	JFK	JFK	EWR	EWR	LAX	DTW
16	SFB	SFB	SFO	SFO	ORD	ORD
17			LAX	SFB	MIA	<b>IAH</b>
18			ORD	ATL	MCO	MIA
19			ONT	HNL	SFO	MCO
20			ATL	<b>IAH</b>	<b>IAH</b>	ONT
21			HNL	MIA	SFB	LAX
22			JFK	ONT	ONT	SFB
23			MIA	JFK	JFK	JFK

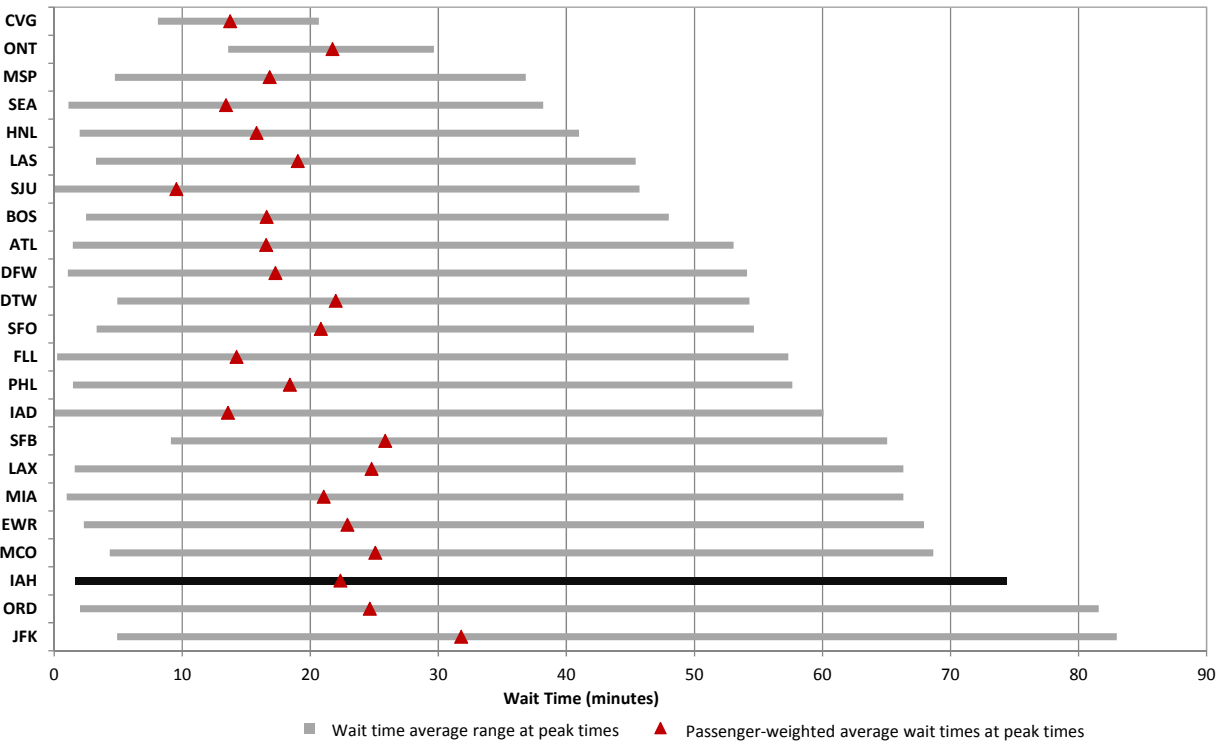
Best  
  
 Worse

Airports ranked based on the passenger-weighted monthly average CBP wait times reported in the CBP Airport Wait Times website at <http://apps.cbp.gov/awt/index.asp> for flight processing times at primary processing area. For 2006-2007 only 16 airports reported.

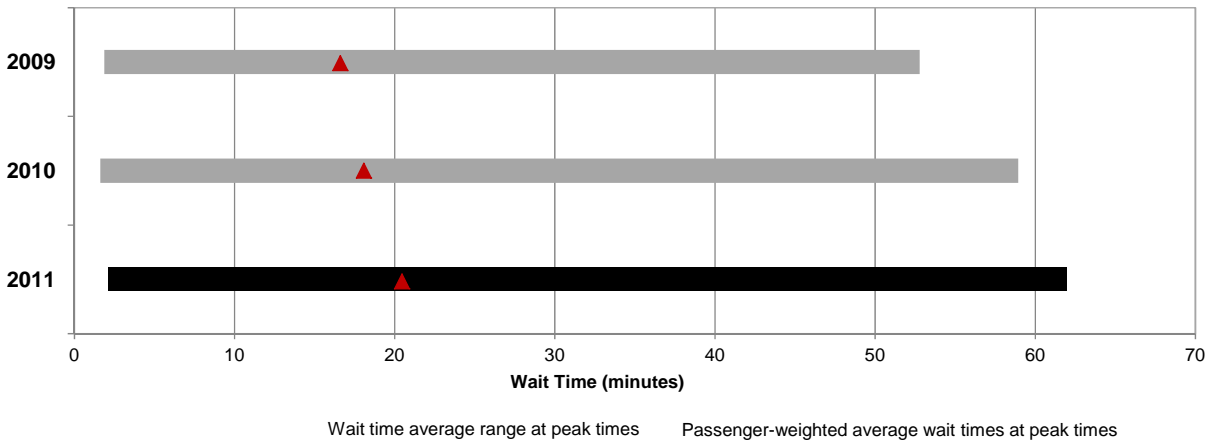
## The Economic Impact of Dividing International Air Service between Houston Airports

IAH's relative performance is especially challenged during peak international arrival times, with wait times regularly exceeding one hour, and with higher average wait times than at the key competing hubs of ATL and DFW. In fact, as shown in Exhibit 39, in 2011, IAH ranked in the bottom three airports in the nation in CBP peak wait times as reported in CBP's statistics. Furthermore, IAH CBP wait times during peak hours have been increasing in the last three years (Exhibit 40).

**Exhibit 39: 2011 CBP Wait-Time Range by Airport**



**Exhibit 40: Three Year IAH Wait-Time Average and Range at Peak Times**

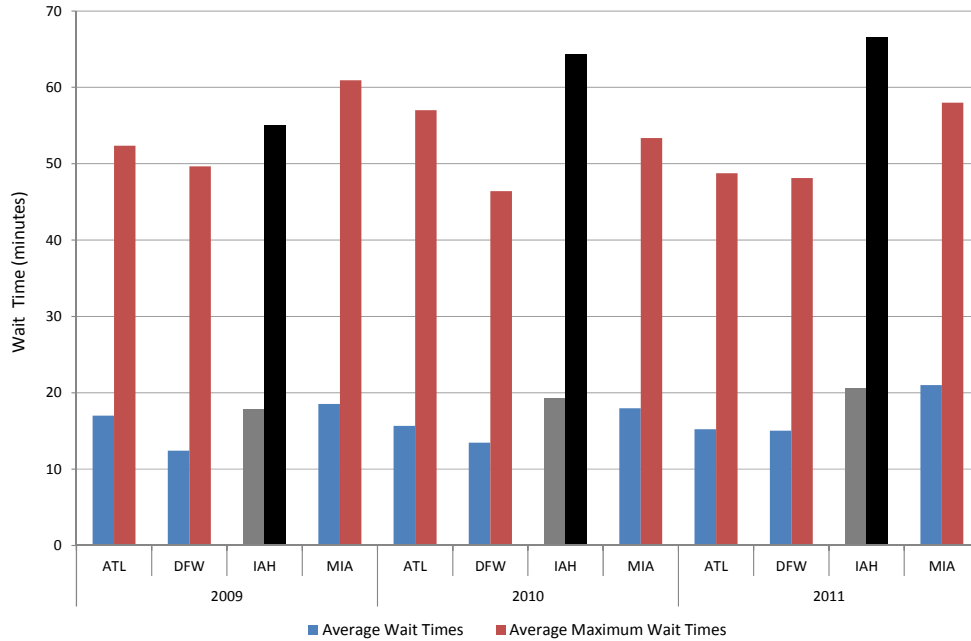


Wait time ranges are from averages for minimum to averages for maximum average CBP wait time as reported in the CBP Airport Wait times website <http://apps.cbp.gov/awt/index.asp>. Peak times reflect top four one-hour time periods based on arrival passenger counts processed by CBP.

CBP wait times not only affect passengers' perceptions of an arrival airport's service performance, but also affect an airport's overall competitiveness. Clearance time is one of the key elements determining airline connecting schedules. Slower lines require airlines to increase their connecting times and make an airport less attractive to connecting passengers.

As shown in Exhibit 41, IAH's average CBP wait times were longer than wait times at ATL and DFW and therefore put it at a competitive disadvantage. Frequent international business flyers consider the speed and efficiency of customs processing when they choose their itineraries. ATL's opening of an additional international terminal in May of this year will further exacerbate this competitive imbalance.

**Exhibit 41: CBP Wait Times at Key Southern Hubs**



Passenger-weighted annual averages for monthly CBP wait times reported in the CBP Airport Wait Times website at <http://apps.cbp.gov/awt/index.asp> for flight processing times at primary processing area.

**c) Substantial Funding Increases of Federal Budgets, Including CBP’s, are Extremely Unlikely, Further Stressing CBP’s Houston Field Office**

The nation's increasing debt has forced Congress and the Administration to face the harsh budget reality that federal programs must shrink. In fact, the Administration’s proposed FY13 budget has no year-over-year increase in CBP Officers and calls for a reduction in overtime. In addition, existing federal budgets will be subject to sequestration and potentially steep cuts in January 2013, and earmarks that were once used by Members of Congress to boost CBP resources/staffing at various international gateways are no longer allowed under House and Senate rules. Given the state of our federal debt, this budget environment is not likely to change anytime soon. It is therefore highly unlikely that increases sufficient to expand CBP resources in Houston to cover a new FIS at Hobby will be secured in the foreseeable future. Even if additional resources are made available, a better and more efficient use of these resources for Houston would be to increase the competitive nature of IAH as a premier international hub by adding the resources/staffing there to reduce wait times as compared to ATL, DFW, and other competitive international gateways.

Facing increased demands with finite resources, CBP will be forced to shift personnel from IAH, the Port of Houston, and other stations and functions in the region in order to manage the new FIS facility at Hobby. This reallocation of resources will further increase wait times at IAH, which already has wait

times that are not competitive with other regional international gateways. Resource sharing across airports is inefficient.

## 7) The HAS Hobby Study Ignores the Environmental Impact

In addition to its numerous failings on economic grounds, assumptions, financing, and CBP staffing, the HAS Hobby Study also avoids any discussion of the significant environmental impacts associated with the proposed international service at Hobby as well as the statutorily required analysis of those impacts. This omission of any discussion of the significant environmental impacts of the Proposal substantially inflates the Proposal's benefits to the City and its residents while also misleading the public about its true costs and impacts. Those impacts with associated costs include:

- The proposed \$100-million development, as depicted on the HAS website, would require substantial revisions to the Hobby Airport Layout Plan.
- The large number of additional aircraft operations proposed by Southwest would bring increased aircraft noise and emissions to noise-sensitive areas in the vicinity of Hobby, not to mention increased automobile emissions associated with the hundreds of thousands of new passengers being projected to access the terminal.
- The project is not yet completely defined, yet Mr. Diaz notes that runway length at Hobby is a limiting factor for international operations proposed there. The current Master Plan includes several taxiway modifications as well as a runway extension of 2,400 feet and another runway extension of over 3,000 feet.

These impacts and the cumulative effects of the projects listed (plus those which the City of Houston and Southwest have not yet revealed) mean that the projects cannot be funded and built unless and until the Federal Aviation Administration (**FAA**) prepares an environmental analysis. The FAA makes the determination whether an environmental impact study (**EIS**) or other environmental review will be required for such projects. If the FAA determines an EIS is required under applicable statutory standards, it will include full public participation and consultation of other agencies with jurisdiction to fully inform the public of the proposal's full, significant impacts on the environment around Houston Hobby.

In addition to an environmental review, coordination with federal agencies which have jurisdiction beyond the FAA is mandated by other federal laws, including those designed to protect areas containing natural surface water drainages, resources of potential national historical significance (e.g., Native American cultural features or artifacts), and endangered species. There is no evidence that HAS has considered the potential impact of the proposed projects on any of these statutorily protected categories.

## 8) Conclusions

Mr. Diaz proposes that the City make a change in aviation policy that will forever alter Houston's economic future. He bases his recommendation on the HAS Hobby Study, which reaches its erroneous conclusions on air passenger service and jobs on the basis of fundamentally flawed assumptions, and also fails entirely to account for the Proposal's service, financial, environmental and CBP-related impacts on the City, its residents, and its passengers. The HAS Hobby Study's analytical flaws and incorrect assumptions render it completely unreliable as a basis for the decision to change 40 years of policy that IAH is the City's sole international airport.

The Proposal would:

- Harm IAH and the City's position as a premier international gateway, making it less competitive with DFW, ATL, and other unified international gateways;
- Result in a net loss to the City of 3,700 jobs and \$295 million in gross regional product per year;
- Be paid for by HAS debt to be repaid by a 50% increase in PFCs that would be borne by all passengers using Hobby Airport;
- Exacerbate the already long CBP processing wait times for passengers at IAH, further degrading its position as an international gateway vis-à-vis competing international gateway hubs such as DFW and ATL;
- Have significant environmental impacts that the HAS Hobby Study has ignored; and
- Undermine \$1 billion in investments United has made at IAH since 1996 and another \$700 million it just announced in good-faith reliance on HAS maintaining its policy of keeping IAH the sole international airport.

The United Study is an effort to help ensure that, when the Administration and City Council make this seminal decision, they are able to make it with an understanding of the facts about the real impact that their decision will have on Houston's future.

## Appendix A

### ***The Proposed Growth Missions for Southwest at Hobby are Not Viable Under the Assumptions Presented***

The Southwest growth markets as presented in the HAS Hobby Study are expected to lose \$76 million per year based on the assumptions presented in that study and publicly available financial information on Southwest Airlines (adjusted to include ancillary revenue and cost premiums on international flights). These results imply that much of this growth will not occur and, at the very least, Southwest will be unable to lower fares by the amounts assumed in the HAS Hobby Study.

**Exhibit 42: Expected Southwest Airlines' Loss Under the HAS Assumptions**

Market	Stage Length	CASM	Daily Departures	Load Factor	% Local	Fare	Pax Revenue	Other Revenue	Total Revenue	Total Expense	Profit
Bogota	2,206	8.58	1.00	67%	67%	133	9,102,520	570,182	9,672,702	19,305,080	(9,632,378)
Cancun	793	12.45	4.00	74%	41%	108	32,802,732	2,054,762	34,857,494	40,283,929	(5,426,435)
Caracas	2,245	9.59	1.00	70%	76%	135	9,713,242	608,437	10,321,679	21,985,960	(11,664,281)
Guadalajara	805	12.65	1.00	40%	40%	108	4,351,104	272,553	4,623,657	10,384,030	(5,760,373)
Liberia	1,457	9.08	1.00	63%	58%	122	7,858,996	492,287	8,351,283	13,508,230	(5,156,947)
Mexico City	744	13.44	4.00	73%	51%	106	31,448,080	1,969,907	33,417,987	40,798,345	(7,380,358)
Monterrey	398	18.43	2.00	30%	62%	93	5,638,962	353,224	5,992,186	14,962,166	(8,969,979)
Puerto Vallarta	877	12.20	1.00	68%	33%	110	7,573,940	474,431	8,048,371	10,919,702	(2,871,331)
San Jose	1,533	9.42	1.00	72%	52%	123	9,077,031	568,585	9,645,616	14,735,424	(5,089,808)
San Jose Cabo	998	11.29	3.00	53%	55%	113	12,248,861	767,268	13,016,129	23,004,011	(9,987,881)
San Salvador	1,170	10.67	1.00	66%	69%	117	7,866,144	492,735	8,358,879	12,736,057	(4,377,178)
<b>Total</b>	<b>1,012</b>	<b>11.47</b>	<b>20.00</b>	<b>65%</b>	<b>52%</b>	<b>112</b>	<b>137,681,612</b>	<b>8,624,372</b>	<b>146,305,984</b>	<b>222,622,934</b>	<b>(76,316,950)</b>

Source: WN FY 2011 financials as reported in 10K filing; HAS Hobby Study.

## Appendix B

### United's Houston Impact Study's Passenger Volume Estimates

This appendix elaborates the United Airlines estimates for both the passenger impacts at Hobby and at IAH.<sup>63</sup> The output below is based on applying the hypothetical schedule from the HAS Hobby Study to United's ordinary course QSI-based passenger forecast and share models.

#### Exhibit 43: Expected Southwest Airlines' Loss Under the HAS Assumptions

##### United Study

*Excludes Mexican LCCs*

Houston Impacts	Houston Resident	Houston Visitor	Transit Passenger	Total Passengers
<b>Step 1 : WN Adds / No UA Reaction</b>				
Local Market Stimulation to HOU	27,391	7,516	0	34,908
Shift from Other Gateway Cities	61,032	16,605	156,936	234,573
Diversion from IAH	191,707	62,877	463,601	718,184
<b>Net Gain / (Loss) at HOU</b>	<b>280,131</b>	<b>86,998</b>	<b>620,537</b>	<b>987,665</b>
Local Market Stimulation to IAH	40,621	12,075	0	52,696
Less Diversion from IAH	(191,707)	(62,877)	(463,601)	(718,184)
<b>Net Gain / (Loss) at IAH</b>	<b>(151,085)</b>	<b>(50,802)</b>	<b>(463,601)</b>	<b>(665,489)</b>
<b>Net Gain / (Loss) for Houston</b>	<b>129,045</b>	<b>36,196</b>	<b>156,936</b>	<b>322,176</b>
<b>Step 2 : UA Reduces IAH Flying</b>				
Less Diversion from IAH	(389,798)	(239,565)	(1,492,856)	(2,122,220)
<b>Net Gain / (Loss) for Houston</b>	<b>(260,753)</b>	<b>(203,370)</b>	<b>(1,335,921)</b>	<b>(1,800,043)</b>
<b>Step 3 : UA Forgoes Future Growth</b>				
Less Diversion from IAH	(150,695)	(79,872)	(400,061)	(630,628)
<b>Net Gain / (Loss) for Houston</b>	<b>(411,448)</b>	<b>(283,242)</b>	<b>(1,735,981)</b>	<b>(2,430,671)</b>

Note: Forecast is for WN only and excludes Mexican LCCs

<sup>63</sup> The data sums from left to right: Houston Resident traveler, Houston Visitor traveler, and Connecting (transit) traveler. Note the data are in (Passengers per Day Each Way) \* 2 \* 365, so for the number of visitors staying in Houston that drive local expenditure, you would need to divide by 2, whereas for the number of Transit passengers you would not divide by 2, since they connect through the airport twice, once in each direction.



## Appendix C

### *Details of United's Total Economic Impact Analysis*

#### **Assumptions and Inputs**

As explained in the report, Dr. Smith's Analysis of the total economic impact of new international service at Hobby begins with a set of assumptions largely provided by United. Dr. Smith's Analysis excludes the impact of the FIS construction at Hobby and the loss of construction at IAH resulting from failure to initiate phases 2 and 3 of planned IAH expansion. Dr. Smith used the following assumptions regarding the timing of events:

- Year 1
  - United eliminates unprofitable flying at IAH
- Years 2-4
  - Southwest begins flying new international routes at Hobby
  - Price competition temporarily stimulates traffic
  - United cancels more flights.
- Years 4-10
  - Steady state period
  - United fails to add planned expansion flights

Changes in passenger volume were estimated by United. Appendix B provides details.

Visitors' spending in Houston was assumed to be \$436.00 per trip on average and connecting passengers spending was assumed to be \$11.29 per trip on average. Spending by residents is assumed to be zero, which obviously excludes minor expenditures such as parking.

While the total impact to the City would include both the impact from the change in operations and the impact from the change in construction, the results in Section 4 are for the "steady-state" (Years 4-10) without the construction impact. Results of both are shown below. The construction includes the positive impact of the construction of the new facilities at Hobby (which is complete at the end of Year 1) and the negative impact if failing to initiate phases 2 and 3 of the planned IAH expansion construction. This is referred to as the "Operating Phase Results". The impact including construction is also shown below.

#### **Operating Phase Results**

The operating phase results shown in Exhibit 44 represent estimates of the steady-state equilibrium impact of new international service at Hobby, excluding the impact of changes in construction activity. The economic impact results cited in the main report correspond to the operating phase.

## The Economic Impact of Dividing International Air Service between Houston Airports

The steady state change in employment is a loss of 3,699 jobs, which represents 1,503 added jobs at Hobby and 5,203 lost jobs at IAH. The steady state change in Value-Added is a loss of \$295 million annually which represents a gain of \$120 million at Hobby and a loss of \$414 million at IAH.

### Exhibit 44: Operating Phase Results

Operating Phase, Years 4 - 10					
	Employment	Labor Income	Value Added	Output	Local Taxes
<b>Total (Hobby + IAH)</b>					
Direct Effect	-2,195	-91,883,458	-150,827,676	-315,269,254	
Indirect Effect	-630	-38,659,517	-66,592,082	-117,217,319	
Induced Effect	-874	-42,178,711	-77,130,899	-119,776,327	
<b>Total Effect</b>	<b>-3,699</b>	<b>-172,721,686</b>	<b>-294,550,658</b>	<b>-552,262,900</b>	<b>-\$19,758,692</b>
<b>Hobby</b>					
Direct Effect	892	37,335,399	61,286,456	128,104,707	
Indirect Effect	256	15,708,687	27,058,646	47,629,415	
Induced Effect	355	17,138,656	31,340,929	48,669,228	
<b>Total Effect</b>	<b>1,503</b>	<b>70,182,743</b>	<b>119,686,031</b>	<b>224,403,350</b>	<b>\$8,028,634</b>
<b>IAH</b>					
Direct Effect	-3,087	-129,218,858	-212,114,132	-443,373,960	
Indirect Effect	-886	-54,368,204	-93,650,729	-164,846,734	
Induced Effect	-1,230	-59,317,367	-108,471,828	-168,445,556	
<b>Total Effect</b>	<b>-5,203</b>	<b>-242,904,428</b>	<b>-414,236,689</b>	<b>-776,666,250</b>	<b>-\$27,787,326</b>