InterVISTAS
AVIATION TRANSPORTATION TOURISM

TURKISH AVIATION ACADEMY

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Financial Analysis

Istanbul Technical University

Air Transportation Management, M.Sc. Program

Aviation Economics and Financial Analysis

Module 5

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Route Financial Analysis Issues

- **Discussion of some of the issues involved in route financial analysis**
  - Variable versus fixed costs
  - Revenue: local vs onward

- **Example: Case of AA's DFW 12th Complex**

DFW 12th Complex: Situation

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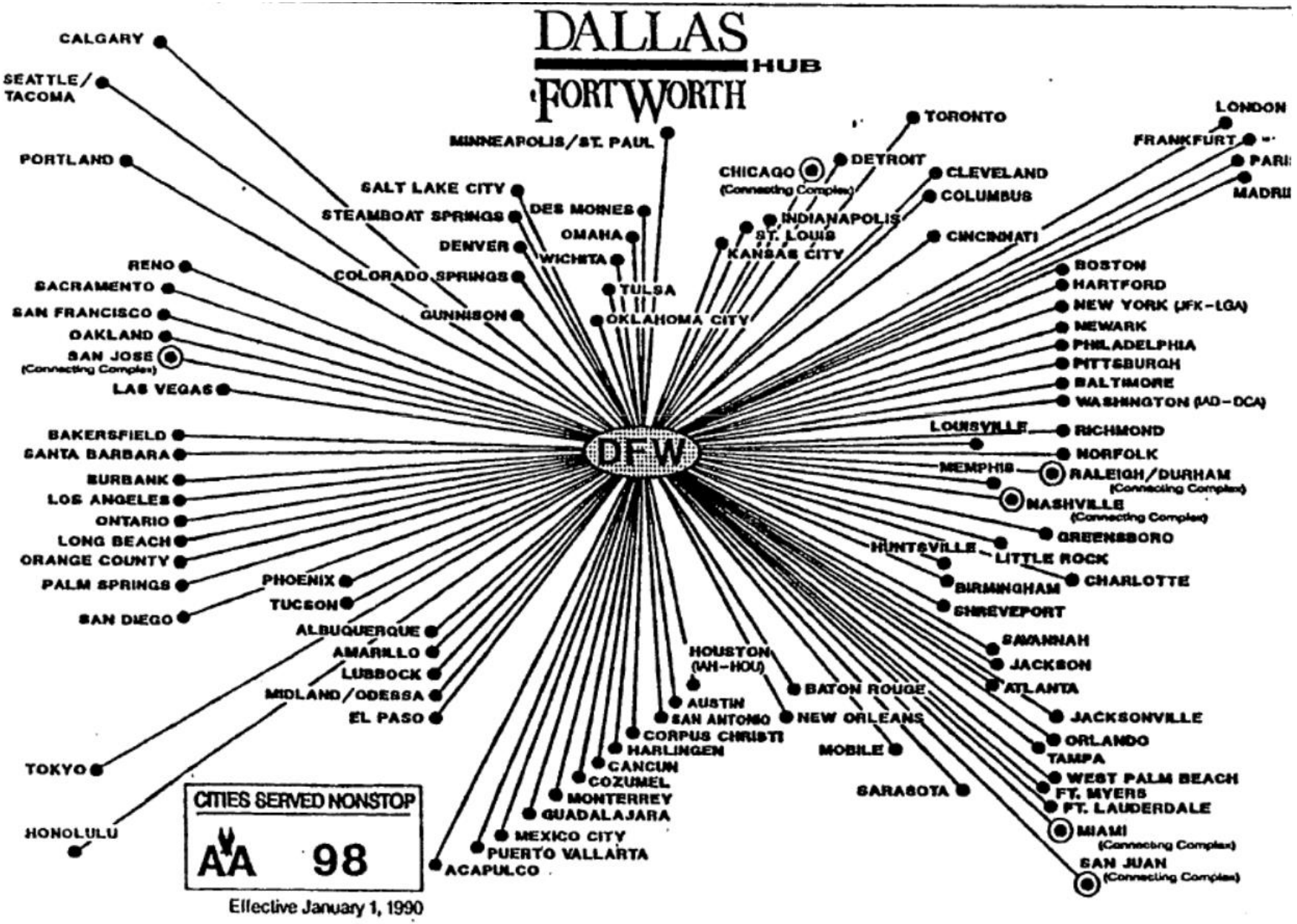
- **American Airlines (AA) operate a hub at Dallas Forth Worth Airport (DFW)**
- **The hub has 12 waves (complexes) of flights.**
  - A complex will have a wave of flights arrive and then a wave a flights depart after passengers make connections
  - Usually each wave is directional
    - E.g., Flights arrive from West, then depart to East.
    - This maximises the number of viable connection pairs


DALLAS
HUB
FORT WORTH
DFW
CALGARY
SEATTLE/
TACOMA
PORTLAND
RENO
SACRAMENTO
SAN FRANCISCO
OAKLAND
SAN JOSE
(Connecting Complex)
LAS VEGAS
BAKERSFIELD
SANTA BARBARA
BURBANK
LOS ANGELES
ONTARIO
LONG BEACH
ORANGE COUNTY
PALM SPRINGS
SAN DIEGO
PHOENIX
TUCSON
ALBUQUERQUE
AMARILLO
LUBBOCK
MIDLAND/ODESSA
EL PASO
TOKYO
HONOLULU
SALT LAKE CITY
STEAMBOAT SPRINGS
DENVER
COLORADO SPRINGS
GUNNISON
MINNEAPOLIS/ST. PAUL
DES MOINES
OMAHA
WICHITA
TULSA
OKLAHOMA CITY
CHICAGO
(Connecting Complex)
DETROIT
TORONTO
CLEVELAND
COLUMBUS
INDIANAPOLIS
ST. LOUIS
KANSAS CITY
CINCINNATI
LONDON
FRANKFURT
PARI
MADRI
BOSTON
HARTFORD
NEW YORK (JFK-LGA)
NEWARK
PHILADELPHIA
PITTSBURGH
BALTIMORE
WASHINGTON (IAD-DCA)
LOUISVILLE
RICHMOND
NORFOLK
MEMPHIS
RALEIGH/DURHAM
(Connecting Complex)
NASHVILLE
(Connecting Complex)
GREENSBORO
HUNTSVILLE
LITTLE ROCK
CHARLOTTE
BIRMINGHAM
SHREVEPORT
SAVANNAH
JACKSON
ATLANTA
JACKSONVILLE
ORLANDO
TAMPA
WEST PALM BEACH
FT. MYERS
FT. LAUDERDALE
MIAMI
(Connecting Complex)
SAN JUAN
(Connecting Complex)
HOUSTON
(IAH-HOU)
AUSTIN
SAN ANTONIO
CORPUS CHRISTI
HARLINGEN
CANCUN
COZUMEL
MONTERREY
GUADALAJARA
MEXICO CITY
PUERTO VALLARTA
ACAPULCO
BATON ROUGE
NEW ORLEANS
MOBILE
SARASOTA
CITIES SERVED NONSTOP
AA 98
Effective January 1, 1990

12th Complex

- **Last of the day**
- **Smaller**
- **Not purely directional**
  - Hence fewer connection opportunities

12th Complex

- **3 months prior, additional trips added**
  - All were variable flying (i.e., no new aircraft required).
    - For example, the Albuquerque trip was retimed to arrive in DFW at 22:20.
    - Previously, this aircraft ,would have remained overnight in DFW, and would have left DFW the next morning as part of the 08:20 eastbound complex.
    - Instead, now the inbound Albuquerque flight continues on to Little Rock, remains overnight there, flies out at 0630 the following morning on a *balance* trip, and arrives in DFW in time to pick up its 0820

12th Complex

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Hub traffic is often broken down into 3 parts:

- Local
  - travel on only one segment, either from or to the hub. For example, a passenger starting his trip in Dallas/Ft. Worth and ending it in San Antonio would be a local passenger.
- Through
  - 'through passengers travel through the hub on the same flight. For example, if Flight 1275 went from Albuquerque to DFW to Little Rock, passengers flying from Albuquerque to Little Rock would be through passengers.
- Connect
  - Connect passengers travel through the hub, starting on one flight from their home city, and connect to a different flight at the hub to get to their destination. A passenger flying from Albuquerque on Flight 1275 and connecting to the San Antonio flight in DFW would be a connect passenger.

Traffic Division for Individual Flight

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Traffic divided into 2 groups:

- onboard
  - the total traffic carried on a particular trip.
- Upline/downline traffic
  - a subset of onboard traffic
  - made up of the through and connect passengers.

Traffic Division for Individual Flight

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New Business

- Traffic it would not have carried without a new flight
  - Although a new flight may have an adequate load factor, it may be unwarranted if the net increase in traffic carried is relatively small.
  - For example,
    - new 150 seat flight had an average load factor of 60% (i.e. 90 passengers),
    - but the net change in traffic carried on all flights in that market was 30 passengers per day
    - then the new flight may be deemed unnecessary since it effectively has only a 20 percent load factor (30/150)
      - The remaining 40 percent of the load factor is assumed to have been carried at the expense of other flights, diluting their profitability.

Example Financial Information

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	ORIG/DEST	FLT. #	DPTRS	ONBOARD YIELD	AVERAGE PAX/OPN	PER OPERATION ($): TOTAL ONBOARD REVENUE	UP/DOWN REVENUE	VARIABLE CONTRIB	FULLY ALLOCATED CONTRIB	VAR. W/ UP/DOWN CONTRIB	F/A W/ UP/DOWN CONTRIB	(%): VARIABLE CONTRIB MARGIN	FULLY ALLOCATED CONTRIB MARGIN	VAR. W/ UP/DOWN CONTRIB MARGIN	F/A W/ UP/DOWN CONTRIB MARGIN
MAY, 1988															
=========															
12TH COMPLEX TRIPS															
Inbound															
	ABQ DFW	1070	31	11.5	54	4,189	946	(1,153)	(3,117)	(420)	(2,385)	(27.5)	(74.4)	(8.2)	(46.5)
	AMA DFW	518	29	13.4	18	901	271	(2,301)	(3,686)	(2,084)	(3,469)	(255.3)	(409.0)	(177.8)	(295.9)
	ELP DFW	250	31	11.6	59	4,457	1,225	347	(1,761)	1,342	(766)	7.8	(39.5)	23.6	(13.5)
	HOU DFW	358	29	15.0	43	1,859	563	(1,435)	(2,708)	(982)	(2,254)	(77.2)	(145.7)	(40.5)	(93.1)
	LAS DFW	1044	31	10.5	83	10,740	1,942	3,323	(32)	4,820	1,465	30.9	(0.3)	38.0	11.5
	LAX DFW	306	31	15.0	190	41,370	3,331	21,516	14,425	24,225	17,135	52.0	34.9	54.2	38.3
	LBB DFW	1064	31	12.8	24	1,032	352	(2,145)	(3,393)	(1,870)	(3,119)	(207.9)	(328.8)	(135.1)	(225.4)
	MAF DFW	1036	29	13.1	23	1,072	332	(2,081)	(3,189)	(1,818)	(2,926)	(194.2)	(297.6)	(129.5)	(208.4)
	ORD DFW	89	29	18.0	132	22,309	6,256	8,162	3,001	13,237	8,076	36.6	13.5	46.3	28.3
	PHX DFW	920	30	18.4	78	14,522	1,357	4,897	(501)	5,976	579	33.7	(3.4)	37.6	3.6
	SAN DFW	210	31	13.5	78	14,485	3,296	6,808	3,378	9,493	6,063	47.0	23.3	53.4	34.1
	SAT DFW	1028	31	14.5	32	1,349	538	(1,687)	(3,095)	(1,253)	(2,661)	(125.1)	(229.5)	(66.4)	(141.1)
	SFO DFW	264	31	12.8	135	29,666	2,411	15,448	8,881	17,387	10,820	52.1	29.9	54.2	33.7
	SNA DFW	332	26	16.2	84	19,255	2,658	10,687	7,112	12,828	9,252	55.5	36.9	58.5	42.2
	1,414 miles														
Outbound															
	DFW CRP	332	30	18.6	79	6,086	6,809	2,493	718	8,040	6,266	41.0	11.8	62.3	48.6
	DFW HOU	1036	29	17.9	55	2,854	4,310	(548)	(1,633)	2,929	1,846	(19.2)	(57.2)	40.9	25.8
	DFW IAH	1064	31	21.9	38	2,197	3,744	(1,156)	(2,442)	1,891	605	(52.6)	(111.1)	31.8	10.2
	DFW LIT	250	31	14.2	41	2,074	3,146	(986)	(2,575)	1,642	52	(47.5)	(124.2)	31.5	1.0
	DFW MCI	1028	31	15.5	33	2,754	1,829	(474)	(2,466)	961	(1,030)	(17.2)	(89.5)	21.0	(22.5)
	DFW MSY	210	31	12.9	48	3,221	3,563	(279)	(2,181)	2,561	658	(8.7)	(67.7)	37.9	9.7

Guidelines

- **Guidelines**
  - Generally use fully allocated costs
    - Flights collectively must cover all capital costs
    - But for incremental flying which does not displace other flights variable costs might be justified
  - Incremental flights for 12th complex must be evaluated with balanced flights
    - The aircraft must return, even if nearly empty
    - Return must be to do DFW 1st complex mission
  - Upline/downline
    - Is relevant only if the connecting/through passenger is at risk of being lost to another airline (or not doing any trip)
    - A pax diverted from another AA flight is not at risk

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Buy or Lease



Understanding Operational Costs

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B737

737-300						Manufacturer: Boeing								Class: Narrowbody
Average Block Hour Operating Cost	**Crew Cost**	**Fuel/ Oil**	**Aircraft Cost**	**Insur.**	**Taxes**	**Maintenance Direct**	**Maintenance Burden**	**Other**	**Total BH Cost**	**Monthly Aircraft Ownership Cost**	**Rentals**	**Deprec.**	**Amort. Of Cap. Lease**	**A/C Total /Month**
737-300	**$742**	**$2,305**	**$424**	**$13**	**$76**	**$520**	**$85**	**$0**	**$4,165**		**$57,691**	**$56,010**	**--**	**$113,701**
Southwest	$684	$2,308	$420	$14	$78	$441	$84	$0	$4,030		$55,050	$58,702	--	$113,752
US Airways	$1,419	$2,278	$474	$1	$46	$1,439	$101	--	$5,758		$84,569	$28,618	--	$113,187

Aircraft Operational Statistics	**Aircraft In Fleet**	**Stage Length**	**Seats/ Dept.**	**Gal. Of Fuel/HR**	**Average Aircraft Operations Per Day: Depts.**	**Block Hrs.**	**RPMs**	**ASMs**	**Load Factor**	**Aircraft Operating Cost/ASM (cents)**	**Crew**	**Aircraft Cost**	**Maintenance**	**A/C Total Per ASM**
737-300	**183**	**533**	**137**	**748**	**5.6**	**9.0**	**317,930**	**410,778**	**77.4%**		**1.6**	**0.9**	**1.3**	**9.1**
Southwest	167	528	137	747	5.8	9.1	323,165	418,691	77.2%		1.5	0.9	1.1	8.7
US Airways	16	595	131	757	4.2	7.9	264,648	330,238	80.1%		3.4	1.1	3.7	13.7

Buy versus Lease Considerations

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Key parameters to consider include

- Buy prices,
  the best purchasing rate obtained from the seller.
  - For example an aircraft listed as 200 million could be reduced to 80 million depending on supply and demand for different aircraft
- Dry Lease rate –
  the best dry lease rate that can be obtained from the industry.
  - Market demand for particular aircraft type and financial strength of the leasing company becomes important in determination

- **Operational costs – these include**

Buy versus Lease Considerations

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Key parameters to consider include

- Operational costs –
  include additional operational costs (e.g., cockpit and cabin crew) of a dry leased aircraft.
- Borrowing rate –
  if the airline is borrowing to purchase aircraft

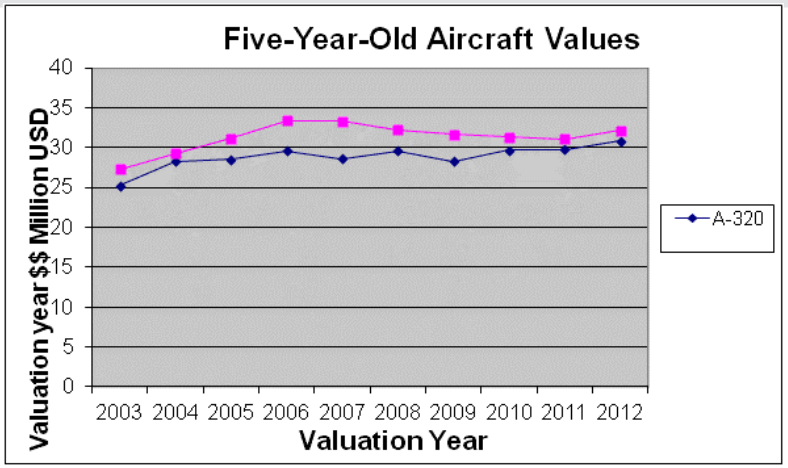
- **Comparative analysis enables airline to determine the most beneficial fulfilment option**
  - An example is provided below

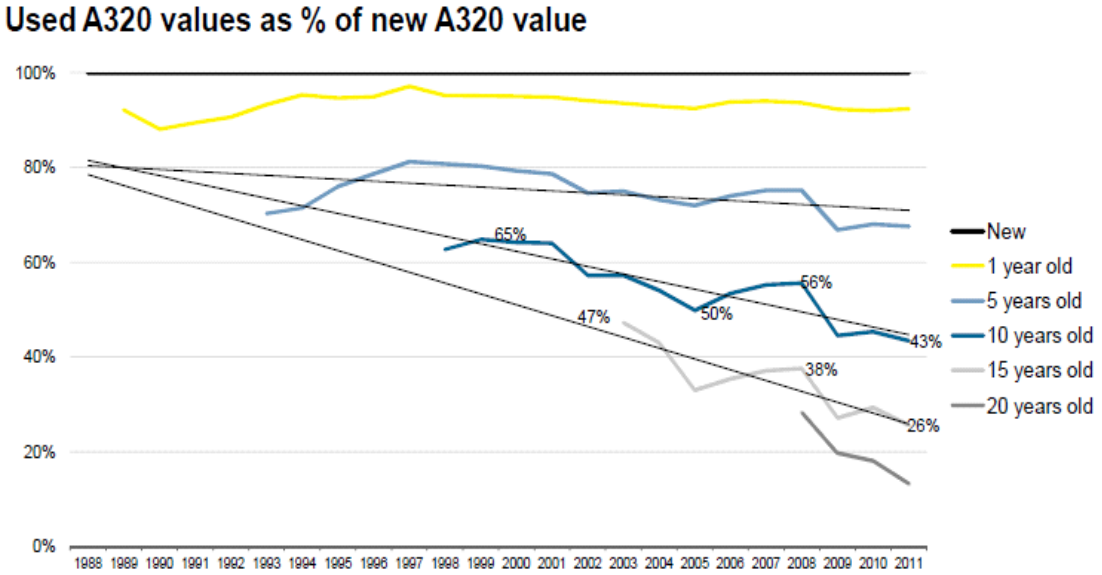
Example Buy Versus Lease Comparison

		Beginning of Year	End of Year 1	End of Year 2		Year 20
Option 1: Buy 2 Freighters @ $80mn each						
Principal: $160 million	Principal Remaining	$ 160,000,000	$ 152,000,000	$144,000,000		$ -
Interest: 5%	Interest Paid		-$ 8,000,000	-$ 7,600,000		-$ 400,000
Principal payback: Straight Line, 20 years	Principal Paid		-$ 8,000,000	-$ 8,000,000		-$ 8,000,000
Maintenance / Crew: Extra	Insurance Costs		-$ 266,667	-$ 266,667		-$ 266,667
Insurance: Extra	Mace Costs		-$ 6,083,515	-$ 6,083,515		-$ 6,083,515
	Crew Costs		-$ 5,069,596	-$ 5,069,596		-$ 5,069,596
	Cash Outflow / Residual Value		-$ 27,419,777	-$ 27,019,777		-$ 19,819,777
	NPV of Cash Outflow (Day 1, Year 1)	-$357,217,586				
Option 2: Dry Lease @ $900,000/mo per Freighter		Beginning of Year	End of Year			
			Year 1	Year 2		Year 20
Monthly Lease Payment: $1.8M	Lease Payment		-$ 21,600,000	-$ 21,600,000		-$ 21,600,000
Maintenance / Crew: Extra	Insurance		$ -	$ -		$ -
Insurance: Included	Mtce Costs		-$ 6,083,515	-$ 6,083,515		-$ 6,083,515
	Crew Costs		-$ 5,069,596	-$ 5,069,596		-$ 5,069,596
	Cash Outflow	$ -	-$ 32,753,110	-$ 32,753,110		-$ 32,753,110
	NPV of Cash Outflow (Day 1, Year 1)	-$473,090,852				
Option 3: Wet Lease @ $900,000/mo per Freighter		Beginning of Year	End of Year			
			Year 1	Year 2		Year 20
Monthly Lease Payment: $1.8M	Lease Payment		-$ 21,600,000	-$ 21,600,000		-$ 21,600,000
Maintenance / Crew: Included	Insurance		$ -	$ -		$ -
Insurance: Included	Mtce Costs		$ -	$ -		$ -
	Crew Costs		$ -	$ -		$ -
	Cash Outflow	$ -	-$ 21,600,000	-$ 21,600,000		-$ 21,600,000
	NPV of Cash Outflow (Day 1, Year 1)	-$311,993,648				

Used aircraft lease rates

- Lease rates are influenced by many factors
- Interest rates/ economic environment
- Lease Terms
- Lessor supply
- Lessee quality





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Thank You!

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