APPENDIX II

Operations Cost Build Up

All costs are in 2022 USD.

Teagenet colspan="2">Teagenet colspan="2" Teagenet colspan="2" Teagenet colspa	Cost Item	KC-135R	A330	KC-46	KC-10	A340F	SAIL-43K Units	SAIL & KC-135 Calculation Basis	A330/KC-46/KC-10 Change	A340 Change vs A330
And capital cost 845,009 1,379,985 1,927,985 1,247,443 1,197,189 1,119,189 provide results monthly loss factor Perfect costs balance base Initial sparse surchase 4,000,000 6,000,000 6,000,000 1,200,000 1,200,000 4,000,000 state 1,210 for 44/0-C23,017.2 State	Capital costs									
Initial gares purchase 4,000,000 8,000,000 <td>Aircraft capital cost</td> <td>845,009</td> <td>1,370,985</td> <td>1,592,794</td> <td>1,247,443</td> <td>1,697,110</td> <td>1,119,198 per aircraft per month</td> <td>monthly lease factor</td> <td>Diff AC cost; same lease factor</td> <td></td>	Aircraft capital cost	845,009	1,370,985	1,592,794	1,247,443	1,697,110	1,119,198 per aircraft per month	monthly lease factor	Diff AC cost; same lease factor	
Space carrying cost X 000 20% <td>Initial spares purchase</td> <td>4,000,000</td> <td>8,000,000</td> <td>8,000,000</td> <td>8,000,000</td> <td>12,000,000</td> <td>4,000,000 per aircraft</td> <td>item only</td> <td>SAIL * 2 given yet larger EW</td> <td></td>	Initial spares purchase	4,000,000	8,000,000	8,000,000	8,000,000	12,000,000	4,000,000 per aircraft	item only	SAIL * 2 given yet larger EW	
Private operations 9 0	Spares carrying cost %						20% % per year	replacement costs	No change required	
Grew 1,000 1,250 1,250 1,250 1,000 per resultation and the second of the		800,000	1,600,000	1,600,000	1,600,000	2,400,000	800,000 per aircraft per year	Annual Income Statement impact for spares		
Crew 1,00 1,250 1,250 1,250 1,250 1,250 1,000 exceed of the control of t	Flight operatiions									
Initial crew training 800,000 800,000 800,000 800,000 800,000 per aircraft, and trained over 10 years, receiving taining years No thinge required No thinge required Maiglation charges 400	Crew	1.000	1.250	1.250	1.250	1.250	1.000 per block hour	275 block hours/month; Includes travel and remote		No change required
Non-singlition charges 200 200 200 400 per kets hor No charge required No charge required Airframe (heavy) 42.986 69,444 55,556 69,444 78,125 42,967 42,67 4,26			· · ·	· · ·	,	,		amortized over 10 years; recurring training cost in	· · · · ·	
Maintenance 3year, 8year, 10 year and 12 year check for 5XI, 12 & 64 yr check for 5XI, 20 et al. 12 & 54 yr check for 5XI, 20 et al. 1		,	,	,	,	,	, ,			• •
Airframe (heavy) 42,986 69,444 55,556 69,444 78,125 42,986 per aircraft per month 3 year, 8 year, 12 year and 12 year checks for 501. 2 & 6 yr checks for 767; possed up yr 1280 for others 777 numbers for A340 Engines 4,267 3,867 5,800 4,267	Navigation charges	400	400	400	400	400	400 per block hour	Typical industry cost	No change required	No change required
Airframe (heavy) 42,985 69,444 55,556 69,444 78,125 42,985 per sincatper month 8 K C135 up by 12% for others 777 numbers for A340 Finite restance 3,867 3,867 5,800 42,67 94,267 engines. 42,67 engines. US 2 or 3 engines. engines. engines. US 2 or 3 engines. engines. US 2 or 3 engines. engines. <td>Maintenance</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Maintenance									
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Airframe (heavy)	42,986	69,444	55,556	69,444	78,125	42,986 per aircraft per month	& KC 135	up by 1.25% for others	777 numbers for A340
Landing gears3,00010,0005,0005,00012,0003,000 per aircraft per monthintervalWielebody costjumb costAux Power Unit357050709035 per block hourTypical Industry costFor sizeFurther increasedLine maintenance300450450450450300 per block hourmarce size industry cost for narrowbody plus a permium for unique parts, modelle hourly despiteGrossed up for sizeFurther increasedSpecialized Equipment250250250250250250250Per block hourconstructions, and disperail equipmentNo change requiredGround Operations3,7665,3547,6232,717 per cycleFor specialized facilitiesSame basis; larger planeSame basis; larger planeGround handling2,0003,0002,5003,0004,0002,000 per cycleTow, pushback, etc; prenium atop typical narrowbycost cort reflex to utilization analycost cost or factor utilization analycost cost or fa	Engines	4,267	3,867	3,867	5,800	4,267	4,267 per aircraft cycle	removals 6000 cycles; 4 engines; Plus \$400 per cycle for life limited parts	e cycles btw removals; \$600 for LLPs; 2 or 3 engines	4 engines, but NB costs for restorations & LLPs
Average industry cost for narrowbody plus a premum for unique parts; modelled hourly despite some cyclic diversAverage industry cost for narrowbody plus a premum for unique parts; modelled hourly despite some cyclic diversSpecialized Equipment250250250250250250250250250250250250250Ground Operations501 per kg of MTOW** (typical industry cost) x 2 for specialized facilitiesNo change requiredNo change requiredNo change requiredGround handling2,0003,0002,5003,0004,0002,000 per cycleTow, pushback, etc.; premium atop typical narrowbody costs to reflect low vilication airportsGrossed up for sizeFurther increasedGround handling0.050.050.050.050.050.05 per kgonly (no offload on landing)Same basis; larger planeSame basis; larger planeInsurance35,20957,12466,36651,97770,71346,633 per aircraft per month0.25% of rom-typical operationSame basis; larger planeFuel usage Arctic18,60731,46421,50033,15729,60032,076Ibs per sortieManual performance calculationFuel usage Antractic18,60731,46421,50033,15729,60032,076Ibs per sortieManual performance calculationLind usage ferry108,397122,65979,869154,458104,36182,450Ibs per sortieManual performance calculationLing per del price2,5002,5002,5002,500	Landing gears	3,000	10,000	5,000	5,000	12,000	3,000 per aircraft per month			Jumbo cost
Line maintenance300450450450450300 per block hourpermium for unique parts; modelled hourly despitGrossed up for sizeFurther increasedSpecialized Equipment250<	Aux Power Unit	35	70	50	70	90	35 per block hour	Typical industry cost	Grossed up for size	Further increased
Specialized Equipment250250250250250250250250 per block hourcombustion, and dispersal equipmentNo change requiredNo change requiredGround OperationsLanding fees2,9264,6643,7665,3547,6232,717 per cycleSol 1 per kg of MTOW** (typical industry cost) x 2 for specialized facilitiesSame basis; larger planeSame basis; larger planeSame basis; larger planeGround handling2,0003,0002,5003,0004,0002,000 per cyclenarrowbody costs to reflect low utilization airports only fino diffication airportsGrossed up for sizeFurther increasedGround handling0.050.050.050.050.050.05 per kgOnly fino diffication cost only fino diffication cost (typical industry cost), 22 Soft acquisition airport airportSame basis; larger planeSame basis; larger planeInsurance35,20957,12466,36651,97770,71346,633 per aircraft per month 0.25% of const-typical operation)Same basis; larger planeSame basis; larger planeFuel usage Artcitic18,60731,46421,50033,15729,60032,076 libs per sortie 0.32,076 libs per sortieManual performance calculationImage basis; larger planeSame basis; larger plane <t< td=""><td>Line maintenance</td><td>300</td><td>450</td><td>450</td><td>450</td><td>450</td><td>300 per block hour</td><td>premium for unique parts; modelled hourly despite</td><td>Grossed up for size</td><td>Further increased</td></t<>	Line maintenance	300	450	450	450	450	300 per block hour	premium for unique parts; modelled hourly despite	Grossed up for size	Further increased
Landing fees2,9264,6643,7665,3547,6232,717 per cycle\$0.01 per kg of MTOW** (typical industry cost) x 2 for specialized facilitiesSame basis; larger planeSame basis; larger planeGround handling2,0003,0002,5003,0004,0002,000 per cycleTow, pushback, etc.; premium atop typical narrowbody costs to reflect low utilization airpointsGrossed up for sizeFurther increasedCargo handling0.050.050.050.050.050.05 per kgonly (no offload on landing) 0.25% of acquisition cost jopical operation)Same basis; larger planeSame basis; larger planeInsurance35,20957,12466,36651,97770,71346,633 per aircraft per month0.25% for non-typical operation)Same basis; larger planeSame basis; larger planeFuel usage Arctic18,60731,46421,50033,15729,60032,076 lbs per sortieManual performance calculationFuel usage ferry108,397122,65979,869154,458104,36182,450 lbs per sortieManual performance calculationLubs per gallon777777Fuel price2.502.502.502.502.502.502.50Overhead250,000250,000250,000250,000250,000per aircraft per monthObjatch, crew scheduling, flight planning, Flight Ops and Tech Ops administration, other G&A	Specialized Equipment	250	250	250	250	250	250 per block hour		No change required	No change required
Landing fees2,9264,6643,7665,3547,6232,717 per cyclefor specialized facilitiesSame basis; larger planeSame basis; larger planeGround handling2,0003,0002,5003,0004,0002,000 per cycleTow, pushback, etc.; premium atop typical narrowbody costs to reflect wullikation airportsGrose up for sizeFurther increasedCargo handling0.050.050.050.050.05 per kgonly (no offload on landing)Same basis; larger planeSame basis; larger planeInsurance35,20957,12466,36651,97770,71346,633 per aircraft per month0.25% of acquisition cost (typical) 0.25%, addedFuel usage Arctic18,60731,46421,50033,15729,60032,076 lbs per sortieManual performance calculationFuel usage ferry108,397122,65979,869154,458104,36182,450 lbs per sortieManual performance calculationLisp per gallon7777777Fuel price2.502.502.502.502.502.50projected long-term cost per gallonOverhead250,000250,000250,000250,000250,000250,000projected long-term cost per gallon	Ground Operations									
Ground handling 2,000 3,000 2,500 3,000 4,000 2,000 per cycle narrowbody costs to reflect low utilization airports Grossed up for size Further increased Cargo handling 0.05 0.05 0.05 0.05 0.05 0.05 per kg only (no offload no landing) Same basis; larger plane	Landing fees	2,926	4,664	3,766	5,354	7,623	2,717 per cycle		Same basis; larger plane	Same basis; larger plane
Cargo handling 0.05 0.05 0.05 0.05 0.05 0.05 0.05 price only (no offload on landing) Same basis; larger plane Same basis; larger plane Insurance 35,209 57,124 66,366 51,977 70,713 46,633 per aircraft per month 0.25% of acquisition cost (typical) 0.25%, added Fuel usage Arctic 18,607 31,464 21,500 33,157 29,600 32,076 lbs per sortie Manual performance calculation Same basis; larger plane Same basis; larger plane Fuel usage Antarctic 18,607 31,464 21,500 33,157 29,600 32,076 lbs per sortie Manual performance calculation Same basis; larger plane Same basis; larger plane Fuel usage ferry 108,397 122,659 79,869 154,458 104,361 82,450 lbs per sortie Manual performance calculation Same basis; larger plane Same basis; larger plane <td>Ground handling</td> <td>2,000</td> <td>3,000</td> <td>2,500</td> <td>3,000</td> <td>4,000</td> <td>2,000 per cycle</td> <td>narrowbody costs to reflect low utilization airports</td> <td>Grossed up for size</td> <td>Further increased</td>	Ground handling	2,000	3,000	2,500	3,000	4,000	2,000 per cycle	narrowbody costs to reflect low utilization airports	Grossed up for size	Further increased
O 0.5% of acquisition cost (typically 0.25%, added 0.25% for non-typical operation) Same basis; larger plane Insurance 35,209 57,124 66,366 51,977 70,713 46,633 per aircraft per month 0.25% for non-typical operation) Same basis; larger plane Same basis; larger plane Fuel usage Articic 18,607 31,464 21,500 33,157 29,600 32,076 lbs per sortie Manual performance calculation Fuel usage ferry 108,397 122,659 79,869 154,458 104,361 82,450 lbs per sortie Manual performance calculation Lbs per gallon 7 7 7 7 7 7 Fuel price 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 250,000	Cargo handling	0.05	0.05	0.05	0.05	0.05	0.05 per kg		Same basis; larger plane	Same basis; larger plane
Fuel usage Antarctic 18,607 31,464 21,500 33,157 29,600 32,076 lbs per sortie Manual performance calculation Fuel usage ferry 108,397 122,659 79,869 154,458 104,361 82,450 lbs per sortie Manual performance calculation Lbs per gallon 7 7 7 7 7 Fuel price 2.50 2.50 2.50 2.50 2.50 Projected long-term cost per gallon Overhead 250,000 250,000 250,000 250,000 250,000 250,000 projected long-term cost per gallon	. <u> </u>		57,124	66,366		70,713			Same basis; larger plane	Same basis; larger plane
Fuel usage Antarctic 18,607 31,464 21,500 33,157 29,600 32,076 lbs per sortie Manual performance calculation Fuel usage ferry 108,397 122,659 79,869 154,458 104,361 82,450 lbs per sortie Manual performance calculation Lbs per gallon 7 7 7 7 7 Fuel price 2.50 2.50 2.50 2.50 2.50 Projected long-term cost per gallon Overhead 250,000 250,000 250,000 250,000 250,000 250,000 projected long-term cost per gallon	Fuel usage Arctic	18,607	31,464	21,500	33,157	29,600	32,076 lbs per sortie	Manual performance calculation		
Fuel usage ferry 108,397 122,659 79,869 154,458 104,361 82,450 lbs per sortie Manual performance calculation Lbs per gallon 7 7 7 7 7 7 Fuel price 2.50 2.50 2.50 2.50 2.50 2.50 Projected long-term cost per gallon Overhead 250,000 250,000 250,000 250,000 250,000 project for month Ops and Tech Ops administration, other G&A		,	,	,	,	,	, ,			
Lbs per gallon 7 7 7 7 7 Fuel price 2.50 2.50 2.50 2.50 2.50 2.50 Projected long-term cost per gallon Overhead 250,000 250,000 250,000 250,000 250,000 250,000 per aircraft per month Ops and Tech Ops administration, other G&A	-	,	,	,	,	,	, ,			
Fuel price 2.50 2.50 2.50 2.50 2.50 2.50 per gallon Projected long-term cost per gallon Overhead 250,000 250,000 250,000 250,000 250,000 per aircraft per month Dispatch, crew scheduling, flight planning, Flight				,			7			
Overhead 250,000 250,000 250,000 250,000 250,000 per aircraft per month Ops and Tech Ops administration, other G&A		2.50	2.50	2.50	2.50	2.50	2.50 per gallon	Projected long-term cost per gallon		
Payload cost 0.35 0.35 0.35 0.35 0.35 0.35 per kg Sourced from de Vries et al. 2020	Overhead	250,000	250,000	250,000	250,000	250,000	250,000 per aircraft per month			
	Payload cost	0.35	0.35	0.35	0.35	0.35	0.35 perkg	Sourced from de Vries et al. 2020		

*OEW: Operating empty weight ** MTOW: Maximum take off weight # USGS: US Geological Survey