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State of New Mexico
LEGISLATIVE FINANCE COMMITTEE

325 Don Gaspar • Suite 101, Santa Fe, New Mexico 87501
(505) 986-4550 Fax: (505) 986-4545

DAVID ABBEY
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August 1, 2005

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MEMORANDUM

TO: Dannette Burch, Deputy Director, Department of Finance and Administration

THROUGH: Cathy Fernandez, Deputy Director, Legislative Finance Committee

FROM: David Hadwiger, Principal Analyst

SUBJECT: OPERATING COST ESTIMATES – CESSNA CITATION BRAVO

Representative Varela requested that we provide you with the methodology used by LFC staff to compare the cost of operating the Cessna Citation Bravo with the cost of operating two alternatives—the King Air C-90 that is currently in the state fleet and the King Air 350 which is a component of the state's purchase agreement with Cessna. We welcome your comments and feedback at your earliest convenience.

As an overview, it should be noted that the General Services Department (GSD) has criticized numbers released in this study that were generated by that agency, not by LFC staff. The LFC study reviewed the GSD cost estimates and produced lower operating cost estimates for the Citation Bravo than those provided by GSD.

Background. When the executive announced plans to acquire a new Cessna Citation Bravo jet on June 6, 2005, GSD provided two graphs (Attachments A and B) indicating the new jet would result in significant savings for fuel and maintenance. A legislative request asked LFC staff to evaluate claims made by GSD about the costs to operate the Bravo, including a review of total operating costs. There were four components to the LFC evaluation: 1) procuring GSD cost estimates, 2) validating GSD cost estimates for operating costs of the Bravo, 3) estimating the operating cost of a comparably priced turboprop plane – the King Air 350, and 4) evaluating the effect of the price guarantee on operating cost estimates for the Bravo.

Step One: Procuring GSD Cost Estimates. On June 7, 2005, LFC staff asked GSD for a copy of the GSD analysis of costs to operate the Bravo and King Air C-90 (the plane that the Bravo will replace). On June 10, GSD provided LFC staff with a copy of the purchase agreement and the operating cost estimates in Attachment C, showing the GSD analysis of the costs to operate

the Bravo (“new plane”) and three planes currently in the state fleet. Because these numbers did not appear to correspond to those in the graphs, LFC staff asked if these were the current GSD estimates of the cost of operating the new jet (see Attachment D). GSD reiterated that they were and again provided a copy of the table in Attachment C. After LFC staff completed the second step of the review, GSD was provided a copy of the LFC estimates and asked for comments on July 1 (see Attachment E). No comments were received.

The GSD cost estimates for the Bravo and C-90 are in the table below.

COST ESTIMATES PROVIDED BY GSD

ANNUAL COST COMPARISON - FY06	GSD estimate Citation Bravo	GSD cost King Air C-90
Annual Number of Flight Hours	200	397
Annual Costs		
Pilot(s)	104,900.00	86,900.00
Fuel (\$2.70/gal)	105,000.00	111,200.00
Maintenance	55,400.00	69,800.00
Pilot medical exams	200.00	100.00
Insurance	33,200.00	13,400.00
Travel	6,500.00	5,300.00
Equip/Maint inventory	1,200.00	2,400.00
Property Insurance	30,000.00	7,900.00
Utilities/ISD	1,200.00	2,400.00
Training	54,000.00	24,600.00
Hangar rental	11,800.00	21,100.00
TOTAL COSTS	403,400.00	345,100.00
Cost per hour	\$ 2,017.00	\$ 869.27

- **Findings based on GSD estimates. The GSD cost estimates indicate that, in terms of total operating costs, the Bravo is more expensive to operate than the King Air C-90. The GSD cost estimates indicate the Bravo will cost \$2,017.00 per hour to fly or 132% more than the King Air C-90.**

Step Two: Validating GSD Cost Estimates. To validate the GSD cost estimates, LFC staff identified independent sources for pilot, maintenance, and fuel costs, and average flight speed. Based on average flight speed and number of hours, it was determined that the GSD analysis assumed the Bravo would fly 70,600 nautical miles in FY06 versus 83,370 miles for the King Air C-90. To provide a fair comparison, the Citation Bravo cost estimates were based on the same mileage as for the King Air C-90.

Pilots. There are currently four pilots assigned to the Aviation Division. Each of the turboprop planes is flown by one pilot. GSD indicated the Bravo will be flown by two pilots. The LFC analysis added the salaries and benefits costs of the two pilots in the Aviation Division with the lowest salaries. This should be a conservative estimate because it is possible GSD will use higher paid pilots to fly the Bravo.

Maintenance. Cessna provided hourly operating costs for the Bravo in its bid document (Attachment F). Cessna indicated these numbers are drawn from an industry publication (The

Aircraft Cost Evaluator 2004) that is commonly used for this purpose. To validate the GSD estimates of maintenance costs, the hourly maintenance costs provided by Cessna were multiplied by the number of hours the jet was projected to fly in FY06.

Fuel costs. To validate the GSD numbers, the hourly fuel costs provided by Cessna were multiplied by the number of hours the jet was projected to fly in FY06.

Other costs. All other costs were projected at the level in the GSD analysis due to lack of time and requisite information to validate those costs.

Average Speed. Average speed of the Bravo was taken from the Cessna estimates in Attachment F. Cessna indicated this data was developed from manufacturers' published flight performance data. Average speed of the King Air C-90 was identified from an internet search for average speed of the 1978 model of this plane.

The LFC validation findings are shown in the table below.

ANNUAL COST COMPARISON - FY06	LFC estimate	GSD estimate
	Citation Bravo	Citation Bravo
Average Speed (knots)	353	353
Annual Distance (nautical miles)	83,370	70,600
Annual Number of Flight Hours	236	200
Annual Costs		
Pilot(s)	108,129.00	104,900.00
Fuel (\$2.70/gal)	98,839.50	105,000.00
Maintenance		55,400.00
- Labor	21,378.62	
- Parts	17,767.49	
Pilot medical exams	200.00	200.00
Insurance	33,200.00	33,200.00
Travel	6,500.00	6,500.00
Equip/Maint inventory	1,200.00	1,200.00
Property Insurance	30,000.00	30,000.00
Utilities/ISD	1,200.00	1,200.00
Training	54,000.00	54,000.00
Hangar rental	11,800.00	11,800.00
TOTAL COSTS	384,214.62	403,400.00
Cost per hour	\$ 1,626.82	\$ 2,017.00
Cost per nautical mile	\$ 4.61	\$ 5.71

- **Findings Based on LFC Validation.** The LFC validation found that the GSD overestimated costs for fuel and maintenance of the Citation Bravo and slightly underestimated the cost of pilots. In all, GSD overestimated total operating costs of the Citation Bravo by 19 percent.

Step Three: Estimating Operating Costs of King Air 350. To estimate the costs of operating the King Air 350, LFC staff identified independent sources of cost estimates for pilot, maintenance and fuel costs, as well as average flight speed.

Pilots. The LFC analysis used the cost of one mid-level salary pilot and benefits.

Maintenance. The hourly maintenance costs provided by Cessna (Attachment F) were multiplied by the number of hours the King Air 350 was projected to fly in FY06.

Fuel costs. The hourly fuel costs provided by Cessna were multiplied by the number of hours the King Air 350 was projected to fly in FY06.

Other costs. All other costs were projected at the level in the GSD analysis due to lack of time and requisite information to validate those costs.

Average Speed. Average speed of the King Air 350 were taken from the Cessna estimates in Attachment F.

The LFC findings are shown in the table below alongside the GSD estimates for the costs of the Bravo and C-90.

ANNUAL COST COMPARISON - FY06	GSD estimates		LFC estimate
	Citation Bravo	King Air C-90	King Air 350
Average Speed (knots)	353	210	286
Annual Distance (nautical miles)	70,600	83,370	83,370
Annual Number of Flight Hours	200	397	291.50
Annual Costs			
Pilot(s)	104,900.00	86,900.00	59,573.36
Fuel (\$2.70/gal)	105,000.00	111,200.00	83,428.30
Maintenance	55,400.00	69,800.00	
- Labor		-	19,151.78
- Parts		-	20,959.10
Pilot medical exams	200.00	100.00	100.00
Insurance	33,200.00	13,400.00	33,200.00
Travel	6,500.00	5,300.00	6,500.00
Equip/Maint inventory	1,200.00	2,400.00	1,200.00
Property Insurance	30,000.00	7,900.00	30,000.00
Utilities/ISD	1,200.00	2,400.00	1,200.00
Training	54,000.00	24,600.00	54,000.00
Hangar rental	11,800.00	21,100.00	11,800.00
TOTAL COSTS	403,400.00	345,100.00	321,112.54
Cost per hour	\$ 2,017.00	\$ 869.27	\$ 1,101.57
Cost per nautical mile	\$ 5.71	\$ 4.14	\$ 3.85

- **Findings Based on LFC Operating Cost Estimate of King Air 350.**
 - **The LFC cost estimate of the total operating cost of the King Air 350 is lower than the GSD cost estimate of the total operating cost of the Bravo.** The GSD cost estimates indicate the Bravo will cost \$2,017.00 per hour to fly or \$5.71 per nautical mile. The LFC cost estimates indicate the King Air 350 would cost \$1,101.57 per hour or \$3.85 per nautical mile.
 - **Based on the GSD cost estimates for the Bravo and King Air C-90 and LFC estimates for the King Air 350, the Bravo is more expensive to operate than the two alternatives in this study.**

Step Four: Adjusting for Operating Cost Guarantee Agreement. The Operating Cost Guarantee Agreement in the purchase agreement guarantees that “the average direct operating cost per nautical mile flown by the Citation Bravo during each of the three consecutive twelve-month periods...shall not exceed the most recent direct operating cost per nautical mile of the King Air 350 as published in the current Conglin & deDecker Associates Aircraft Cost Comparator...” The Guarantee Agreement defines operating cost to include “only the direct cost of aircraft fuel and normal aircraft maintenance services” and specifically excludes all other costs of operation such as pilots, hangar rental, insurance, etc. (Attachment G).

The guarantee does not affect maintenance costs and reduces fuel costs by \$21.6 thousand; however, this does not make the Bravo cost less than the two alternatives.

- **Other Findings.** The LFC review made the following additional findings:
 - **GSD did not provide information to substantiate the cost estimates for a used Bravo, which was presented in the graph distributed to the media when the purchase of the new Bravo was announced.**
 - **The GSD graphs are not apples to apples comparisons if they are based on the data provided by GSD. Flight miles are biased in favor of the Bravo which would fly 70,600 miles in FY06 versus the King Air C-90 which would fly 83,370 under the GSD analysis.**
 - **It is not clear why GSD received no bids for a new King Air B200 or 350. The B200 has been purchased recently by Utah and Colorado for less than \$4 million. The King Air 350 costs roughly the equivalent of the price of the Bravo. The LFC analysis, based on data provided by Cessna, indicates that total annual costs to operate a new King Air 350 are about 11% less than the costs to operate the Bravo.**
 - **It was not possible to reconcile the data provided by GSD in its table of operating cost estimates with data provided in the two graphs.**
 - i. **The GSD graph shows total annual maintenance costs for the Bravo to be \$21 thousand in FY06 – FY10, with a small spike in FY08. The data provided by GSD shows maintenance costs of the Bravo at \$55 thousand in FY06. The guarantee provided by Cessna does not affect these numbers.**
 - ii. **The GSD graph shows annual maintenance plus fuel costs of the Bravo at \$126 thousand in FY06. The data provided by GSD indicates this amount is \$160.4 thousand. The GSD graph shows annual maintenance plus fuel costs of the King Air C-90 at \$176.7 thousand. The data provided by GSD indicates this amount is \$181 thousand.**