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## THE VERY LIGHT JET ARRIVES: STAKEHOLDERS AND THEIR PERCEPTIONS

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### ABSTRACT

This article summarizes the initial results of a systematic study that addressed issues related to the direct and indirect market impact of very light jet (VLJ) aircraft. Although reports in the popular press offer wide-ranging estimates of the impact that these new jets will have on existing air travel, no systematic data exists that may be of use to all potential stakeholders. This introductory study serves to describe potential VLJ users and their perceptions of this new type of aircraft.

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## INTRODUCTION

On rare occasions, revolutionary products will enter an existing market and offer a design so unique as to create a new product classification. Much like the change in the computer industry brought about by the introduction of the personal computer or the change in the phone industry brought about by the advent of the cellular phone, many experts in the aviation industry feel that the very light jet (VLJ), known by some as the microjet (Seidenman, 2004), will also have a ground-breaking effect on the air travel equation. These aircraft will have five to six passenger seats, weigh less than 10,000 pounds, and be able to operate safely from airports with runways as short as 3,000 feet. Initial data indicates that these aircraft will offer jet utility and performance and will be able to operate at lower costs relative to traditional jets (Asker, 2005). Industry insiders predict that VLJs will bring about dramatic changes for air travelers, aircraft operators, and providers of aircraft support services. The president of the National Business Aircraft Association (NBAA) predicts a new era of business travel will begin with the introduction of the VLJ (Morrison, 2005).

On July 27, 2006, the Federal Aviation Administration (FAA) granted provisional certification to Eclipse Aviation and its Eclipse 500 (FAA, 2006), the first of fourteen manufacturers seeking certification of twin- and single-jet designs, ranging from the traditional Cessna Aircraft Company to the nontraditional Honda Motor Company (Haines, 2005; Lunsford, 2004; VLJ Magazine, 2007). In support of the aircraft, the NBAA, based on its knowledge of the users and manufacturers of these aircraft, has developed and released pilot training guidelines that many predict will become a baseline for VLJ insurance coverage, a service necessary for aircraft financing (NBAA, 2005; Trautvetter, 2005b). In a related article, Asker (2005) reviewed recent VLJ sales data and noted that aviation industry analysts have predicted hundreds of cities could be transformed by low-cost air taxi service through the introduction of VLJs. Ells (2005) noted that travelers are becoming more aware of the utility and economy of airport-to-airport direct travel and affordable VLJs will provide a big boost to this market. Support for these predictions can be found in a recent report of a Teal Group study. This study concluded that business jet service is expected to grow because unlike air carriers operating from larger airports, business jets can serve smaller cities and offer less hijack threat and less security hassle (Solon, 2005).

Studies conducted by organizations or by manufacturers are routinely referenced, and positive forecasts for future growth in the VLJ market are commonly cited in today's literature (Seidenman, 2004; Trautvetter, 2005a). The depth and completeness of these studies are not publicly available,

however, and no common VLJ market information exists for all stakeholders. For example, the question of sales demand for VLJ aircraft is a basic inquiry for manufacturers entering this market. When looking at published research, Trautvetter (2005a) found wide-ranging estimates of VLJ demand with Rolls-Royce predicting 8,000 deliveries by 2023, Inflight Management Development Centre forecasting sales of 847 aircraft by 2013, and the FAA forecasting demand for 4,500 aircraft by 2016. Market data from manufacturers is equally confusing with a sales forecast of from 5,000 to 10,000 VLJs by 2014 (Seidenman, 2004).

### **INSURANCE, TRAINING, AND REGULATORY ISSUES**

Predicting the availability of services in support of VLJ operation is important. Olcott (2004) reviewed the emerging VLJ market and discussed how best to train pilots, gain acceptance by the professional flying community and the FAA, and overcome the problem of insurability of owner-pilots. In reviewing some of these same concerns, Trautvetter (2005a) suggested that because of FAA scrutiny and NBAA training guidelines, insurance costs for VLJ aircraft could be less than turboprop single-engine aircraft. The *NBAA Training Guidelines for Single Pilot Operation of Very Light Jets and Technically Advanced Aircraft* was completed in January 2005 and included guidelines for initial candidate evaluation, pre-training study, manufacturer's training, post rating training, initial operating experience, and annual recurrent training. The guidelines cover four levels of training and suggest level of training should be based on experience. For example, a pilot transitioning from the left seat of a jet aircraft is classified in category 1 and would receive 25 hours of operating experience while a less experienced single-engine pilot would be classified in category 4 and would receive 100 hours of operating experience. Intermediate level single- and twin-engine turboprop cabin-class experience would require 35 hours for category 2 training and 50 hours for category 3 training. Cessna Aircraft Company and Adam Aircraft Company have predicted anywhere from 14,000 to 20,000 twin-engine and turboprop aircraft owners as potential customers to move up to a VLJ (Trautvetter, 2005b). Similar guidelines for dual or mentor instruction are evident for the leading manufacturers (Eclipse, 2007; Sierra, 2007).

In a presentation at the Latin American Business Aviation Event, Stine (2005) noted many common misconceptions about the availability of insurance for owner-flown VLJs. In his summary, he stated that VLJ certification will follow predictable past models, most insurance underwriters are studying coverage guidelines, and some companies have already announced VLJ coverage based on proficiency and specific training requirements. In a more recent review of the state of the aircraft insurance

industry, Chappell (2006) concluded that VLJs would be insurable and premiums would be based on aircraft quality; pilot skill and experience; and transition training programs. He also concluded that the jet single-pilot operation would be insured at higher liability limits accompanied by higher premiums.

Government support for these aircraft is also critical to success. In his review of government support initiatives, Stine (2005) found several positive examples. He noted that the FAA had provided additional resources for VLJ aircraft certification and revisions were being considered to key Federal Aviation Regulations to allow Part 23 certification for single-pilot Part 135 operations. He also found the FAA was supporting the development of FAA Industry Training Standard for Technically Advanced Aircraft. He concluded that once certified and in service, VLJs are more likely to use smaller general aviation airports and thus would not add to congestion at larger airports. This logic should be supported by most air-taxi operators seeking efficiency, profitability, and point-to-point customer travel needs.

Reviewing the good and bad aspects of VLJ operations, Webster (2006) offered his expert commentary to the International Risk Management Institute. In his review he considered the range of pilot skills, aircraft use, and owner-pilot background. He concluded faster aircraft could be safer aircraft if pilots are properly trained and the new aircraft type is given respect.

### **RESEARCH METHODOLOGY**

This study was undertaken to provide the data needed to answer some of these questions about the VLJ market. The data was gathered by means of a self-administered questionnaire delivered electronically via the Internet. The mailing list for the study was an opt-in list of magazine subscribers to *Business & Commercial Aviation*. The questionnaire consisted of a section designed to measure the use of air service by respondents' organizations, a section designed to assess perceptions and expected use of VLJ aircraft, and a demographic section to measure business characteristics.

### **PRELIMINARY RESULTS**

While the response rate for the study is disappointing (160 respondents or 3.18%), the sample achieved does appear to be representative of the target population. The validity of the sample may be indicated by two factors. First, those organizations that operate their own passenger aircraft stressed the importance of the availability of resources for such travel to a statically greater extent than organizations that do not operate their own aircraft. Second, and even more revealing regarding the nature of the sample, those that operate their own aircraft were statistically more likely to use VLJs for

trips under 500 miles than organizations that do not operate their own aircraft. In other words, the sample appears to consist primarily of organizations that comprise the target market for VLJs.

Furthermore, in summarizing significant positive responses (Table 1), we observed that the majority of the organizations represented in the sample, 59.4%, use air services often (multiple flights per week) or extensively (multiple flights per day) and the vast majority of firms operate their own passenger aircraft (72.5%). Additionally, 78.8% of the respondents occupy middle managers or higher positions in their firms. Even more importantly, 73.8% identify themselves as either a strong influencer or the main decision maker for the buying center of the organization. Not surprisingly, most company trips are comprised of management personnel, 40.6%, or a mixture of different personnel, 53.8% (Table 2). Finally, the majority of respondents appear to work for large businesses in that 60.1% reported annual organizational revenues of more than \$6,000,000 and employment of an average of 4,536 organizational employees (Tables 3 and 4).

**Table 1. Use of Air Service**

	Yes (N=160)	Percent
1. Does your organization use air services multiple times/day?	39	24.4%
2. Does your organization use air services multiple times/week?	56	35.0%
3. Does your organization operate its own passenger aircraft?	116	72.5%
4. Percent of flights using commercial air carriers?	147	91.9%
5. Do you prefer jet aircraft over turboprop aircraft?	118	73.8%
6. Percent of your flights involving 6 or fewer personnel?	141	88.1%
7. Percent of your flights involving 4 or fewer personnel?	127	79.4%
8. Are you in a key managerial position in your firm?	126	78.8%
9. Are you a strong influencer or buying center decision maker?	118	73.8%

**Table 2. Type of Personnel that Uses Passenger Air Services**

	Number	Percent
No one	3	1.9%
Primarily upper management	53	33.1%
Primarily middle management	9	5.6%
Primarily line management	3	1.9%
Sales Representatives	5	3.1%
Other Personnel	1	0.6%
A mixture of different personnel	86	53.8%
<b>Total</b>	<b>160</b>	<b>100.0</b>

**Table 3. Considerations before a Very Light Jet Purchase**

	Min	Max	Mean	Std. Dev
To be considered effective, how many hours per year should very light jet aircraft be used?	2	1,008	343	205
To be considered effective, how many trips (flights) per year should the very light jet be used?	1	600	109	105
Number of locations your organization operates	1	1,000	32	123
Number of employees in your organization	1	80,000	4,536	12,771
Number of college educated employees in your organization	0	30,000	570	3,122

Of key interest are the results regarding the number of personnel using air services and the likelihood the use of air services will increase with the introduction of VLJs. Understanding that VLJs can accommodate up to six passengers, respondents were asked how many organizational personnel typically board the same flight. Of the sample, 88.1% reported that normally six or fewer of their personnel fly on the same flight (Table 1). With a normal seating capacity of six to seven (Seidenman, 2004) and with manufacturers targeting air-taxi operators and owner-pilots, VLJs appear to be well suited to address these organizations' air service needs.

**Table 4. Annual Gross Sales/Revenues for Respondent Organizations**

	Frequency	Percent Responding
Less than \$500,000	19	8.1
\$500,000-\$1,000,000	12	6.3
\$1,000,001-\$6,000,000	23	12.5
\$6,000,001-\$10,000,000	10	8.8
Over \$10,000,000	69	51.3
Missing (did not answer)	27	13.1
<b>Total</b>	<b>160</b>	<b>100.0</b>

The respondents indicated a strong preference for flying on jets as opposed to turboprop aircraft, 73.8% (Table 1). They also indicated they would expect to fly these aircraft an average of 343 flight hours/year and operate an average of 109 flights per year (Table 3). The respondents also were asked how likely their use of air services would increase once VLJs are introduced. Of the sample, 53.8% indicated either "perhaps would increase" or "absolutely would increase," and 8.7% of the sample was unsure (Table 5). Thus, the potential market for VLJs seems quite strong, as a large percentage of air service clients may be likely to switch to them once they are introduced. Looking at the classifications of the respondents' organizations (Table 6), we observe that services represent the largest respondent group, 37.5%, followed by manufacturing, 24.4%, with

transportation being the largest single respondent group, 20%. Most organizations had less than 10 different personnel using air services, or 45.7%; however, 23.1% said that over 100 different personnel used air services annually (Table 7).

**Table 5. Increase in Use of Passenger Air Services Due to Availability of Very Light Jet**

	<b>Frequency</b>	<b>Percent</b>
Yes, absolutely	31	19.4
Perhaps	55	34.4
No	60	37.5
Don't know/unsure	14	8.7
<b>Total</b>	<b>160</b>	<b>100.0</b>

**Table 6. Industrial Classification of Respondent Organizations**

	<b>Frequency</b>	<b>Percent</b>
Manufacturing (industrial)	19	11.9
Manufacturing (technological)	12	7.5
Manufacturing (consumer)	8	5.0
Finance/Real Estate/Insurance	27	16.9
Merchandising/Retail-services	4	2.5
Other services	29	18.1
Government	7	4.4
Utilities	2	1.3
Transportation	32	20.0
Construction/Engineering	8	5.0
Communication	7	4.4
Other	2	1.3
Missing (did not answer)	3	1.9
<b>Total</b>	<b>160</b>	<b>100.0</b>

**Table 7. Annual Number of Personnel Using Air Service**

	<b>Frequency</b>	<b>Percent Responding</b>
None	2	1.3
1-5	55	34.4
6-10	16	10.0
11-25	18	11.2
26-50	18	11.2
51-75	7	4.4
76-100	6	3.8
Over 100	37	23.1
Missing	1	0.6
<b>Total</b>	<b>160</b>	<b>100</b>

The respondents were asked to rate VLJ use on a scale of 1 to 5 with 1 being least important and 5 being most important. Of interest we found that VLJ use was considered important for short trips up to 500 miles and longer trips over 500 miles. Operation with a single pilot was not considered to be

a handicap by prospective VLJ users. Most believe that VLJ use would open up new markets but were very concerned about the availability of ground transportation, fuel, and food services at smaller airports (Table 8).

**Table 8. Importance of Very Light Jets and Other Services at Airports**

	Mean	Std. Dev.
How important are VLJs on trips up to 500 miles	3.03	1.048
How important are VLJs on trips over 500 miles?	3.53	1.062
VLJs will open access to new markets.	2.88	1.356
How important is VLJ operation with single-pilot option?	2.16	1.284
How important are ground travel assets at smaller airports?	4.15	0.793
How important is jet fuel availability at smaller airports?	4.31	0.730
How important is food service at smaller airports?	3.09	0.983
Scale: 1 = least important and 5 = most important		
VLJ = Very Light Jets		

In order to further assess the impact that VLJs may have on the market, an examination of factors that were likely to impact the likelihood of increasing air service use due to VLJs was conducted. Regression analysis (see Table 9) revealed that two factors significantly influence increased use. Specifically, the fact that VLJs allow access to previously inaccessible markets, as well as the importance of the availability of food service at small airports, increased the likelihood of increased air service usage. This finding is encouraging in that regarding the marketability of these aircraft, potential customers of VLJs already recognize the prime benefit that VLJs offer their businesses: reaching more of their own customers more easily.

**Table 9. Likelihood That Very Light Jets Will Increase Air Service Use**

Variables	Beta	t	$\rho$
VLJs Allow Access to Previously Inaccessible Markets	.576	6.292	.000
Importance of Food Service for Aircraft at Small Airports	.191	2.082	.041
Adjusted R <sup>2</sup> = .346; F(76 d.f.) = 21.669, p = .000			
VLJ = Very Light Jet			

## CONCLUSIONS

VLJs will soon be available in quantity and will offer budget-minded business travelers a new substitute for traditional airline and executive jet service. Today, fifteen manufacturers are poised to capture part of this new market. Stone (2003) refers to them as a “new generation of aviation entrepreneurs” (p. 60). VLJ supporters seem to view the use of these aircraft as an economical way to save time by avoiding the congestion associated



with large airports; they believe this convenience will open up new customer markets. According to Stine (2005), the argument of some that thousands of VLJs will create their own type of airspace congestion will probably not occur. By design, VLJs can operate from most of the 5000 public use airports in the U.S. while the airlines currently use only 429 (Industry Facts, 2004). Also, of those used by the airlines, only 30 airports are centers for terminal area class B airspace control, and only a minority of this group experiences most of the recorded flight delays annually (Avoiddelays.com, 2007). VLJs by design and due to projected point-to-point use will avoid most of these airports and the approach and departure corridor congestion and delay associated with these airports.

The respondents of this survey seem to represent a good sample of the market for VLJ ownership and air-taxi use. The majority said they are likely to use VLJs when available. A majority seemed to prefer jets and already operate their own aircraft. The fact that almost 90% of the respondents' business trips involve six or fewer people makes the VLJ a strong candidate for these organizations. Not all of the initial manufacturers will survive the market shakeout, and concerns over support services at smaller airports will have to be addressed if the jets are to reach their full potential.

### **FUTURE RESEARCH**

This study focused on describing the prospective operators of VLJ aircraft. Future market research should focus on those stakeholders impacted by the use of this new aircraft type. Specifically, future research should examine the impact of VLJs on airports, maintenance operations, and food service operations, to name a few. In other words, stakeholders need an understanding of how air support services should adapt to meet the needs of VLJ users. Such an examination will provide VLJ manufacturers with a clearer understanding of the true market and impact of these aircraft.

Additional research should focus upon those factors that will drive demand for VLJs. For instance, a better understanding of the needs of air service customers is required, in addition to the psychographic factors (such as trust in the product and/or manufacturer) that may influence customers' demand for these aircraft. With this understanding, VLJ manufacturers will be better positioned to properly market this new product, and air support providers will gain an increased ability to fulfill adequately the new requirements generated by the introduction of these new jets.

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