▷▷▷ APPENDIX I
FORECAST ACCURACY

Forecasts, by their nature, have a degree of uncertainty incorporated in them. They involve not only statistical analyses and various scientific methods, but also judgment, and reliance on industry knowledge and the forecaster's experience to incorporate industry trends not yet reflected in recent results. The FAA's annual Aerospace Forecast is no exception. Given the volatile nature of the U.S. airline industry, it is not surprising that each year's forecast would contain a certain degree of forecast variance. Therefore, FAA forecasters have tried to build forecast models that give a consistent and predictable pattern of results. Analysts relying on the forecasts produced by the models would then be able to adjust for the predictable variance from actual results.

The table below presents an analysis of the variance from historical results for five key forecast metrics during the FY 2003–FY 2008 forecast period. Although this brief period has experienced industry upheaval, FAA's forecast methodology remained consistent during this time. For these reasons, inclusion of prior periods in an analysis of forecast variance might lead to inconclusive, or inaccurate, implications about the accuracy of FAA's current forecast methodology.

The table contains the mean absolute percent errors for the projected values versus the eventual results for U.S. carriers' domestic operations. Each metric has five values showing the relative forecast variance by the number of years in advance the preparation of the forecast took place. For example, the 3 Years column for ASM shows the mean absolute percent error was 6.5 percent for ASM forecasts prepared 3 years in advance. For the period under examination, preparation of the forecasts for FY 2005, FY 2006, FY 2007 and FY 2008 occurred in FY 2003, FY 2004, FY 2005, and FY 2006, respectively.

U.S. AIR CARRIERS
DOMESTIC SCHEDULED PASSENGER OPERATIONS
FORECAST EVALUATION

Forecast Variable	Mean Absolute Percent Error (Combined FY 2003 - FY 2008) (Forecast Variance from Actual) Forecast Performed Years Prior to Actual				
	1 Year	2 Years	3 Years	4 Years	5 Years
ASMs	0.7%	4.1%	7.2%	9.9%	10.9%
RPMs	1.5%	2.9%	4.1%	4.7%	5.4%
Pax Enplanement	1.1%	1.7%	3.7%	4.6%	5.9%
Mainline Pax Yield	2.8%	7.2%	8.6%	7.4%	5.9%
IFR Aircraft Handled	2.0%	4.1%	5.8%	6.1%	6.4%

Presenting forecast variances from actual data in such a manner simplifies a review of longer-term trends. Typically, one would expect the variances to decrease as the forecast year is closer to the year the forecast is prepared. Presenting forecast variances in this way allows an examination of changes in the relative variances by time horizon, signaling when dramatic shifts in accuracy occur.

Examination of the forecast variances reveals several items. First, all the metrics examined, show declining variances as the forecast time horizon decreases, as expected, although the variances in yield increase somewhat between Year 3 and Year 5. The largest variances were found in the forecasts of ASMs and Yield, the two variables most directly affected by carrier business decisions. However, for both of these variables the largest declines in variance occur between Year 3 and Year 1. Second, the FAA's forecast model produces relatively small variances for both of the passenger traffic metrics, Enplanements and RPMs, with none of the forecast variances exceeding 6.0 percent for any forecast time horizon examined. Third, the relative divergence in forecast variances between RPMs and ASMs suggests errors in forecasting load factor.

The examination of the forecast variances over time suggests two primary implications. First, added focus on load factor might improve the model. Currently, load factor is calculated by dividing the forecast RPMs by forecast ASMs. The large difference between the RPM forecast variance and ASM forecast variance beyond Year 2, indicates a relatively large variance in the forecast of load factor, one of the critical elements in converting passenger demand into aviation activity. However, the difference between the RPM forecast variance and ASM forecast variance narrows as the time horizon shortens, suggesting that that the near term load factor forecasts are coming closer to the mark. All other things being equal, large variances in forecasts of load factor will lead to large variances in the long-term forecasts of aviation activity, as can been seen in the variances of the IFR aircraft handled forecasts.

Furthermore, ASMs are becoming increasingly difficult to forecast beyond a relatively short time horizon, as carriers often react to changing market conditions. The relatively large variances in the ASM forecasts suggest that carriers have reacted by permanently removing capacity. Such capacity reductions can be identified in the short term by using advance schedule information. However, FAA's longer-term forecasts rely on anticipated aircraft deliveries and retirements as well as historic relationships between economic activity and capacity deployed. Given the volatile nature of many of the factors that may influence longer term ASM forecasts, a simpler approach, such as RPMs divided by load factor, may improve the long run accuracy of the ASM forecasts.