



## **Continuous Descent Approach at Sacramento Mather Airport**

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The Continuous Descent Approach (CDA) is a method of operating an aircraft on approach that optimizes noise reduction by minimizing changes in thrust by selecting a favorable initial Flight Path Angle (FPA) and by strategic flap/landing gear management. Quite simply, use of a CDA produces the lowest possible single-event noise levels on the ground during approach in areas beyond 7 nm from the runway landing threshold. An important side benefit is that the CDA has the potential to reduce fuel consumption, reduce pilot workload, and save time – features that will make its use at airports nationwide more likely.

A CDA combines the benefits of a continuous descent with the benefits of optimized flap/landing gear management, achieving the lowest noise producing approach for the communities under the CDA. The CDA tested at Louisville International Airport by a team of researchers from the Massachusetts Institute of Technology (MIT), the Boeing Aircraft Company, and UPS demonstrated average single-event noise level reductions of 3.9 to 6.5 decibels (dB) at seven noise measurement sites ranging from 14 to 18 nautical miles (nm) from the runway landing threshold. A report on the CDA test at Louisville identified this reduction in noise as “...very significant given the fact that a 3 dB difference represents a 50% reduction in acoustic energy and is noticeable to the human ear.”

The Mather Aircraft Overflight Noise Group reviewed the MIT report on the CDA test at Louisville and agreed that the CDA may provide single-event noise reductions for the communities greater than 7 nm east of Mather Airport under the Instrument Landing System (ILS) approach. Since UPS has the largest number of arrivals at Mather, the Group felt as though UPS’s participation in the Louisville test might allow for accelerated testing or implementation at Mather Airport. Therefore, the Group recommended that the Sacramento County Airport System (SCAS) solicit UPS’s assistance in testing or implementing the CDA at Mather Airport.

Over nearly a three-year period, the Federal Aviation Administration (FAA) and UPS worked closely with SCAS to design, test, and, ultimately, implement the CDA at Mather Airport. Over that time, the measured single event aircraft noise levels of UPS aircraft have been steadily and significantly reduced. The reduction has been achieved by optimization by the airlines of the CDA procedures, rigorous pilot training, adoption of the CDA as the default procedure for Mather arrivals, assistance by the FAA air traffic controllers, and advocacy for the procedure by SCAS. This procedure was shared with ABX, another nighttime operator at Mather Airport which adapted the procedure to their Boeing 767 aircraft. The initial results for the ABX CDA, which is in its early stages of implementation, are also encouraging. As the ABX CDA is refined and improved, we would expect see lower single event levels.

At some point in all approaches, the pilot will set the flaps, lower the landing gear, and apply the appropriate thrust to bring the aircraft safely down to the runway touchdown point. It is at this point that there is no difference between the standard approach and CDA, and, therefore, the noise levels on the ground are the same for both approaches. During the Louisville test this point was about 7 nm from the runway landing threshold. The 7 nm mile point on the ILS at Mather Airport is approximately to the south-southwest of the Highway 50 Prairie City Road interchange. Therefore, the CDA at Mather may benefit residents in Folsom, El Dorado Hills, and areas to the east of El Dorado Hills.

The comparison of the CDA and non-CDA noise events clearly shows that use of the CDA significantly reduced aircraft noise levels on a single-event basis for UPS's Boeing 757 aircraft approaches into Mather Airport. The average reduction at each of the measurement sites was about 4 decibels for both the Lmax and SENEL values. The 4 dB amount would be noticeable to a listener on the ground.

The reduction in single event noise levels for the ABX 767 CDA were not as consistent as the UPS 757 CDA, but that is to be expected as the ABX CDA is in the early stages of development and implementation. Single event levels are expected to be reduced further as the ABX 767 is studied and refined.

By implementing a CDA at Mather, single event levels of individual air cargo aircraft flights will be reduced which will result in a reduction in the cumulative aircraft noise exposure levels as well.