CLAIMS

1. A method (900) of warning pilots of short landings, the method (900) comprising:
determining that an aircraft is on approach to a runway (904), wherein a runway threshold and a target runway location are associated with the runway;
determining a flight path vector (FPV) location of the aircraft (906) based at least in part on a projected landing location with respect to the runway;
determining a current airspeed of the aircraft (902); and
performing at least one of the following:
issuing a landing short alert (909) to a pilot of the aircraft if the FPV location is at or before the runway threshold (908),
issuing an airspeed caution alert (912) if the FPV location is between the runway threshold (908) and the target runway location (910) and if the current airspeed is below a landing short envelope (911), or
determining not to issue an alert if the FPV location is between the runway threshold (908) and the target runway location (910) and if the current airspeed is at or above the landing short envelope (911).

2. The method (900) of claim 1, further comprising:
determining a landing reference speed (902) based at least in part on a flap setting of the aircraft on approach.

3. The method of claim 2, wherein the FPV location is at or before the runway threshold (908) and a current aircraft speed is below the landing reference speed (907), and wherein the landing short alert (909) comprises a short landing and airspeed warning alert.

4. The method (900) of claim 2 or 3, wherein the FPV location is at or before the runway threshold (913) and a current aircraft speed is above the landing reference speed (907).

5. The method (900) of claim 4, wherein the landing short alert comprises at least one of the following:
a landing short caution alert (916) if a current altitude of the aircraft is above a warning threshold line (914); or
a short landing and pull up warning alert (915) if the current altitude of the aircraft is below the warning threshold line (914).

6. The method (900) of any one of claims 2-5, wherein the airspeed caution alert (912) is issued, and wherein the airspeed caution alert (912) is issued in response to determining that the current airspeed of the aircraft is less than the landing short envelope (911).

7. A system (800) for warning a pilot of an aircraft of a short landing on a runway, the system comprising:
an air data inertial reference unit (ADIRU) (810) configured to determine a flight path vector (FPV) angle of the aircraft and a current airspeed of the aircraft;
a terrain awareness and warning system (TAWS) (820) comprising a runway database having stored therein indications of a runway threshold and a target runway location associated with the runway, wherein the TAWS (820) is further configured to determine a FPV location based on the FPV angle and to determine an alert condition, wherein the alert condition comprises at least one of the following:
a landing short alert (909) if the FPV location is at or before the runway threshold (908),
an airspeed short caution alert (912) if the FPV location is between the runway threshold (908) and the target runway location (910) and if the current airspeed is below a landing short envelope (911), and
no alert if the FPV location is between the runway threshold (908) and the target runway location (910) and if the current airspeed is at or above the landing short envelope (911); or
an alert system configured to issue an alert if the alert condition comprises the landing short warning alert (915) or the landing short caution alert (916).

8. The system (800) of claim 7, wherein the alert system comprises at least one of a display (830) configured to display a word or an indication of the alert condition or an audio system (840) configured to sound a word or a noise of the alert condition.

9. The system (800) of any of claims 7-8, wherein the TAWS (820) and the ADIRU (810) are part of one or more computing systems.

10. The system (800) of any of claims 7-9, wherein the target runway location is an instrument landing system (ILS) location on the runway.

11. The system of claim 10, wherein the TAWS (820) is configured to determine the alert condition when an ILS system of the aircraft is not enabled.

12. A non-transitory computer readable medium (1020) having instructions embodied thereon, the instructions comprising instructions that, when executed by a computing

system, cause the computing system to perform the method of claim 1.

13. The non-transitory computer readable medium (1020) of claim 12, the instructions further comprising instructions that, when executed by a computing system, cause the computing system to:
determine a landing reference speed (902) for a flap setting of the aircraft on approach.

14. The non-transitory computer readable medium (1020) of claim 13, wherein the landing short alert (915) is issued, and wherein issuing the landing short alert comprises issuing a pull up warning if the current airspeed is greater than or equal to the landing reference speed (907).

15. The non-transitory computer readable medium (1020) of claim 13 or 14, wherein the landing short alert (909) is issued, and wherein issuing the landing short alert (909) comprises issuing an increase airspeed warning if the current airspeed is less than the landing reference speed (907).