RUNWAY ARRANGEMENT

Field of invention

This invention relates to runway arrangements, specifically runway arrangements for commercial passenger airports.

Background

Airport capacity (the number of aircraft able to land and/or take off per hour) is often limited by the size, number and configuration of the runways. For safety reasons, there has to be a certain time and distance separation between aircraft landing and/or taking off on the same runway. Often, multiple runways are used; designated either for landing, take-off or mixed mode (where runways are used for both take-offs and landings in turn). This increases airport capacity, but multiple runways need to be spaced sufficiently apart so as not to interfere with one another and to comply with regulatory and safety requirements. In urban or other constrained environments, adequate space for an additional runway may not be readily available, and/or the noise footprint from aircraft using a new runway may not be acceptable. Furthermore, the added time and fuel incurred by taxiing aircraft to a runway further from the terminal may add to the operating cost and CO_2 emissions of the flight.

Summary

According to the present invention there is provided an airport runway arrangement for commercial aircraft, comprising a first runway section; a second runway section extending substantially in prolongation of the first runway section; and an intermediate section, typically an intermediate safety section, between the first and second runway sections.

Preferably the second runway section has the same direction of operation as that of the first runway section.

Preferably the first runway section is designated a landing runway section and the second runway section is designated a take-off runway section.

Preferably an intermediate section is variable such that its location can be changed to be adjacent its previous location, for example in order to extend landing or take off length. The variation of the intermediate section may take the form of pilot notification and/or varying lighting on the runway. The runway may be marked with both locations of the intermediate section.

Two (or more) intermediate sections (each of which may be variable) may be provided per runway, at different locations, one for each direction of operation.

Preferably the or each intermediate section and/or safety section is movable and/or variable in dependence of the type of departing and/or landing aircraft, jet blast effects, aircraft performance effects and/or obstacle limitation surfaces associated with the departing and/or landing aircraft.

Preferably the or each intermediate section and/or safety section is free of on-ground aircraft and/or is unavailable for aircraft taxiing.

Preferably the or each intermediate section is unavailable for use by aircraft to manoeuvre or be manoeuvred across the runway.

Preferably, the or each intermediate safety section is removable, for example in the event that the entire runway is used for an aircraft manoeuvre (such as take-off or landing).

In another aspect of the present invention there is provided an airport runway arrangement comprising a pair of substantially parallel runways, the runways each having a main runway section and an intermediate section adjacent a first end of the main runway section, the intermediate sections of the pair of runways being substantially adjacent each other and laterally offset from one another, and each main runway section extending away from the intermediate section towards a second end thereof in an opposite direction from the other runway.

Preferably the majority of the main runway sections are not adjacent each other.

Preferably the main runway sections have different lengths.

Preferably each substantially parallel runway further comprises an additional runway section extending from the intermediate section in the opposite direction to the main runway.

Preferably the runway arrangement is for aircraft operating under civil regulations.

According to another aspect of the present invention there is provided a method of providing a runway arrangement comprising dividing an existing runway longitudinally into first and second parallel runways; designating a first section of each runway as an intermediate section, and a second part of each runway as the main runway section.

The method preferably comprises extending the length of the runway and/or extending the width of the runway and/or separating the first and second runways.

The method preferably comprises further designating the remainder of each first and second runway as an additional runway.

According to another aspect of the present invention there is provided a method of providing a runway arrangement as described above and herein comprising widening a central section of the runway to provide an intermediate section, and offsetting the centre line of the runway on each side of the central area such that the centre lines are laterally offset in the intermediate section.

According to another aspect of the present invention there is provided a runway comprising a designated landing section and a designated take-off section, the sections being separated by an intermediate section.

In one aspect of the present invention there is provided a runway arrangement comprising a landing threshold which is substantially further along the runway than the start of the runway.

Preferably the landing threshold is between 1km and 5km distal from the start of the landing runway, preferably between 1.5km and 3km, more preferably 2km.

Preferably the position of the landing threshold is adjustable.

In another aspect of the present invention there is provided a method of operating an airport runaway arrangement for commercial aircraft, the method comprising the steps of directing an aircraft to move along a first runway section; directing an aircraft to move along a second runway section; providing an intermediate section between the first and second runway sections.

Preferably the step of directing an aircraft to move along a first runway section comprises directing an aircraft to land.

In another aspect of the present invention there is provided a system incorporating an airport runway configuration as aforesaid, and further comprising: means for defining the first runway section; means for defining the second runway section; and means for defining the intermediate section.

Preferably the means for defining comprises marking the runway.

Preferably the markings comprise at least one of lights, painted markings and reflectors.

Preferably the means for defining comprises means for communicating the definitions of the sections, optionally to a user such as a pilot or an air traffic controller.

Preferably the means for defining is variable in dependence of the type of departing and/or landing aircraft, jet blast effects, aircraft performance effects and/or obstacle limitation surfaces associated with the departing and/or landing aircraft.

The invention extends to any novel aspects or features described and/or illustrated herein.

Further features of the invention are characterised by the other independent and dependent claims.

Any feature in one aspect of the invention may be applied to other aspects of the invention, in any appropriate combination. In particular, method aspects may be applied to apparatus aspects, and vice versa.

Furthermore, features implemented in hardware may be implemented in software, and vice versa. Any reference to software and hardware features herein should be construed accordingly.

Any apparatus feature as described herein may also be provided as a method feature, and vice versa. As used herein, means plus function features may be expressed alternatively in terms of their corresponding structure, such as a suitably programmed processor and associated memory.

It should also be appreciated that particular combinations of the various features

described and defined in any aspects of the invention can be implemented and/or supplied and/or used independently.

In this specification the word 'or' can be interpreted in the exclusive or inclusive sense unless stated otherwise.

The invention extends to methods and/or apparatus substantially as herein described with reference to the accompanying drawings in which:

Figure 1 is an example of an existing airport arrangement;
Figures 2 are examples of a runway arrangement according to one embodiment of the invention;
Figures 3 show the operation of a runway arrangement according to another embodiment of the invention;
Figure 4(a) shows the runway arrangement of Figures 3(a) and (c) together;
Figure 4(b) shows the runway arrangement of Figures 3(b) and (d) together;
Figures 5 show steps in an example method of expanding a runway arrangement according to one embodiment of the invention;
Figures 6 show alternative steps of expanding a runway arrangement to that shown in Figure 5(d);
Figures 7 show an example landing approach according to one embodiment of the invention which can be used with the runway arrangements of Figures 2 to 4;
Figures 8 (a) shows another example landing approach which can be used with the runway arrangements of Figures 2 to 4; and
Figure 8(b) shows the landing approaches shown in Figures 7 and 8(a) combined.

Specific description

The term 'runway' used in this description preferably refers to an area designated and certified by the regulatory and safety authorities for use by an aircraft for taking-off and/or landing. Typically, this is a suitably hard surfaced area which is demarcated (i.e. distinct to taxiways etc.) as a runway.

In the description below the term 'longitudinal length' or 'length' preferably refers to the length of the runway along which an aircraft typically moves when landing or taking-off. The term 'lateral width' or 'width' preferably refers to the width of the runway, or group of runways (depending on context), measured perpendicularly to the longitudinal length.

$$\Delta d = (x - a) \cdot (\tan 5° - \tan 3°)$$
$$\approx 0.035 \cdot (x - a)$$

Where (x-a) is the distance the point of measurement (i.e. the population) is from the point the angle of approach changes (in km).

The combination of the 'long landing' described above and a staged descent means that the noise over a nearby population is significantly reduced; however each of these could be provided independently depending on the situation. Figure 8(b) shows an example landing utilising both the staged approach and the 'long landing' described above. The extra height an aircraft is at, at a distance 'x' from the landing point, is given by:

$$\Delta d = (x - a) \cdot (\tan 5° - \tan 3°) + \Delta x \cdot \tan 3°$$
$$\approx 0.035 \cdot (x - a) + 0.052 \cdot \Delta x$$

For a population 10km away from the usual landing point, and where the angle of approach changes 3km from landing; moving the landing point 2km further means the aircraft are around 350m higher up over the population. This extra height corresponds to a significant reduction in aircraft noise at ground level.

The angle of approach may change closer or further away than the 3km example given above. This may depend on factors such as local regulations and the precise location of the population.

The angles of approach changing from 5^0 to 3^0 is an example step change. A person skilled in the art would realise that a range of differing approach angles could be used depending on the type of aircraft, the airport, the nature of the flight etc. Furthermore, the change may not be a step change; it may be a gradual change from one approach angle to another over a significant distance.

Alternatives and modifications

Although the above description refers to many examples where an airport runway arrangement has two parallel runways, the invention extends to situations where there is a single runway. This would be particularly advantageous in an urban environment where there is only space for a single runway. Furthermore, the invention can also be applied to airports with more than one non-parallel runway. This would be particularly advantageous

in order to increase passenger capacity in situations where non-parallel runways are independently used depending on wind conditions or where space constraints require runways to be non-parallel.

The above description includes numerous references to runway and airport configuration dimensions. These dimensions are merely examples and a person skilled in the art would appreciate that these are dependent on factors such as type of aircraft and the regulations covering the airport. Such modifications could be made by a person skilled in the art and therefore are within the scope of the invention.

Various other modifications will be apparent to those skilled in the art and will not be described in further detail here.

It will be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

Reference numerals appearing in the claims are by way of illustration only and shall have no limiting effect on the scope of the claims.

Claims

1. An airport runway arrangement for commercial aircraft, comprising:

   a first runway section;

   a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section; and

   an intermediate section between the first and second runway sections;

   wherein the intermediate section is designated as an intermediate safety area, said designation indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement;

   thereby simultaneously allowing a landing aircraft to land on one of said first and second runway sections, and a departing aircraft to take off from the other of said first and second runway sections, whilst not using the intermediate section.

2. An airport runway arrangement according to claim 1 further comprising a landing aircraft and a departing aircraft.

3. An airport runway arrangement according to claim 1 or 2 wherein the first runway section is designated a landing runway section and the second runway section is designated a take-off runway section.

4. An airport runway arrangement according to claim 2 further comprising a safety area at the end of said take-off runway section.

5. An airport runway arrangement according to claim 2 or 4 further comprising a safety area at the start of said landing section.

6. An airport runway arrangement according to claim 4 or 5 wherein such safety areas are at least 200m in length.

7. An airport runway arrangement according to claim 6 wherein the safety areas are between 240m and 300m or 600m in length.

8. An airport runway arrangement according to any preceding claim wherein the designation of said intermediate section comprises at least one of lights, markings and reflectors on said runway arrangement.

9. An airport runway arrangement according to any preceding claim wherein the first and second runway sections are substantially the same length.

10. An airport runway arrangement according to any of the preceding claims wherein each runway section is between 1000m and 8000m long.

11. An airport runway arrangement according to claim 10 wherein each runway section is between 1000m and 4000m, preferably between 2200m and 3200m long.

12. An airport runway arrangement according to any of claims 1 to 7 wherein the first and second runway sections are of different lengths.

13. An airport runway arrangement according to claim 12 wherein one runway section is between 1000m and 2500m long and the other runway section between 2500m and 4000m long.

14. An airport runway arrangement according to any preceding claim wherein the intermediate section is between 175m and 1500m in length.

15. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 180m and 1500m in length.

16. An airport runway arrangement according to according to any of claims 1 to 13 wherein the intermediate section is between 200m and 1500m in length.

17. An airport runway arrangement according to according to any of claims 1 to 13 wherein the intermediate section is between 240m and 1500m in length.

18. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 300m and 1500m in length.

19. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 600m and 1500m in length.

20. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 540m and 660m in length.

21. An airport runway arrangement according to claim 20 wherein the intermediate section is approximately 600m in length.

22. An airport runway arrangement according to any of the preceding claims wherein a terminal area is situated adjacent the intermediate section.

23. An airport runway arrangement according to any of the preceding claims further comprising a further runway arrangement parallel to said first and second runway sections.

24. An airport runway arrangement comprising a pair of runway arrangements each according to any of the preceding claims.

25. An airport runway arrangement according to claim 24 wherein the pair of runway arrangements are substantially parallel to each other.

26. An airport runway arrangement according to claim 24 or 25 wherein the pair of runway arrangements formed by the further runway section and said first and second runway sections parallel thereto is separated by at least 1035m.

27. An airport runway arrangement according to any of claims 22 to 26 wherein the further runway arrangement comprises a landing runway section.

28. An airport runway arrangement according to claim 27 when dependent on claim 2 wherein the landing runway section on the further runway arrangement is longer than the landing runway section of said first runway section.

29. An airport runway arrangement according to any of the preceding claims further comprising at least one taxiway adjoining the intermediate section.

30. An airport runway arrangement according to any of the preceding claims, being for commercial passenger carrying aircraft.

31. An airport runway arrangement according to any of the preceding claims, being for aircraft operating under civil regulations.

32. A method of operating an airport runway arrangement for commercial aircraft, the method comprising the steps of:

providing a first runway section;

providing a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section;

providing an intermediate section between the first and second runway sections, the intermediate section being designated as an intermediate safety area, said

designation indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement; and

simultaneously landing an aircraft on one of said first and second runway sections, and taking off an aircraft from the other of said first and second runway sections, whilst not using the intermediate section.

33. A method of directing aircraft to or from a commercial airport runway arrangement, said runway arrangement comprising a first runway section, a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section, and an intermediate section between the first and second runway sections, the intermediate section being designated as an intermediate safety area, said designation indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement,

said method comprising simultaneously directing a landing aircraft to land on one of said first and second runway sections, and a departing aircraft to take off from the other of said first and second runway sections, whilst not using the intermediate section.

34. A method according to claim 32 or 33, using the runway arrangement of any of claims 1 to 31.

35. A system incorporating an airport runway arrangement according to any of claims 1 to 31, and further comprising:

means for defining the first runway section;

means for defining the second runway section.

36. A system according to claim 35 wherein the means for defining comprises marking the runway sections.

37. A system according to claim 36 wherein the marking comprises at least one of lights, painted markings and reflectors.

38. A system according to any of claims 35 to 37 wherein the means for defining comprises means for communicating the definitions of the sections.

39. A system according to claim 38 comprising means for communicating the definitions of the sections to a user such as a pilot or an air traffic controller.

RUNWAY ARRANGEMENT

Field of invention

This invention relates to runway arrangements, specifically runway arrangements for commercial passenger airports.

Background

Airport capacity (the number of aircraft able to land and/or take off per hour) is often limited by the size, number and configuration of the runways. For safety reasons, there has to be a certain time and distance separation between aircraft landing and/or taking off on the same runway. Often, multiple runways are used; designated either for landing, take-off or mixed mode (where runways are used for both take-offs and landings in turn). This increases airport capacity, but multiple runways need to be spaced sufficiently apart so as not to interfere with one another and to comply with regulatory and safety requirements. In urban or other constrained environments, adequate space for an additional runway may not be readily available, and/or the noise footprint from aircraft using a new runway may not be acceptable. Furthermore, the added time and fuel incurred by taxiing aircraft to a runway further from the terminal may add to the operating cost and CO_2 emissions of the flight.

Summary

The invention is defined in the independent claims. Some optional features of the invention are defined in the dependent claims.

According to one aspect there may be provided an airport runway arrangement for commercial aircraft, comprising a first runway section; a second runway section extending substantially in prolongation of the first runway section; and an intermediate section, typically an intermediate safety section, between the first and second runway sections.

Preferably the second runway section has the same direction of operation as that of the first runway section.

Preferably the first runway section is designated a landing runway section and the second runway section is designated a take-off runway section.

Preferably an intermediate section is variable such that its location can be changed to be adjacent its previous location, for example in order to extend landing or take off length. The variation of the intermediate section may take the form of pilot notification and/or varying lighting on the runway. The runway may be marked with both locations of the intermediate section.

Two (or more) intermediate sections (each of which may be variable) may be provided per runway, at different locations, one for each direction of operation.

Preferably the or each intermediate section and/or safety section is movable and/or variable in dependence of the type of departing and/or landing aircraft, jet blast effects, aircraft performance effects and/or obstacle limitation surfaces associated with the departing and/or landing aircraft.

Preferably the or each intermediate section and/or safety section is free of on-ground aircraft and/or is unavailable for aircraft taxiing.

Preferably the or each intermediate section is unavailable for use by aircraft to manoeuvre or be manoeuvred across the runway.

Preferably, the or each intermediate safety section is removable, for example in the event that the entire runway is used for an aircraft manoeuvre (such as take-off or landing).

In another aspect there may be provided an airport runway arrangement comprising a pair of substantially parallel runways, the runways each having a main runway section and an intermediate section adjacent a first end of the main runway section, the intermediate sections of the pair of runways being substantially adjacent each other and laterally offset from one another, and each main runway section extending away from the intermediate section towards a second end thereof in an opposite direction from the other runway.

Preferably the majority of the main runway sections are not adjacent each other.

Preferably the main runway sections have different lengths.

Preferably each substantially parallel runway further comprises an additional runway section extending from the intermediate section in the opposite direction to the main runway.

Preferably the runway arrangement is for aircraft operating under civil regulations.

According to another aspect there may be provided a method of providing a runway arrangement comprising dividing an existing runway longitudinally into first and second parallel runways; designating a first section of each runway as an intermediate section, and a second part of each runway as the main runway section.

The method preferably comprises extending the length of the runway and/or extending the width of the runway and/or separating the first and second runways.

The method preferably comprises further designating the remainder of each first and second runway as an additional runway.

According to another aspect there may be provided a method of providing a runway arrangement as described above and herein comprising widening a central section of the runway to provide an intermediate section, and offsetting the centre line of the runway on each side of the central area such that the centre lines are laterally offset in the intermediate section.

According to another aspect there may be provided a runway comprising a designated landing section and a designated take-off section, the sections being separated by an intermediate section.

In one aspect there may be provided a runway arrangement comprising a landing threshold which is substantially further along the runway than the start of the runway.

Preferably the landing threshold is between 1km and 5km distal from the start of the landing runway, preferably between 1.5km and 3km, more preferably 2km.

Preferably the position of the landing threshold is adjustable.

In another aspect there may be provided a method of operating an airport runaway arrangement for commercial aircraft, the method comprising the steps of directing an aircraft to move along a first runway section; directing an aircraft to move along a second runway section; providing an intermediate section between the first and second runway sections.

Preferably the step of directing an aircraft to move along a first runway section comprises directing an aircraft to land.

In another aspect there may be provided a system incorporating an airport runway configuration as aforesaid, and further comprising: means for defining the first runway section; means for defining the second runway section; and means for defining the intermediate section.

Preferably the means for defining comprises marking the runway.

Preferably the markings comprise at least one of lights, painted markings and reflectors.

Preferably the means for defining comprises means for communicating the definitions of the sections, optionally to a user such as a pilot or an air traffic controller.

Preferably the means for defining is variable in dependence of the type of departing and/or landing aircraft, jet blast effects, aircraft performance effects and/or obstacle limitation surfaces associated with the departing and/or landing aircraft.

Any feature in one aspect may be applied to other aspects, in any appropriate combination. In particular, method aspects may be applied to apparatus aspects, and vice versa.

Furthermore, features implemented in hardware may be implemented in software, and vice versa. Any reference to software and hardware features herein should be construed accordingly.

Any apparatus feature as described herein may also be provided as a method feature, and vice versa. As used herein, means plus function features may be expressed alternatively in terms of their corresponding structure, such as a suitably programmed processor and associated memory.

It should also be appreciated that particular combinations of the various features

described and defined in any aspects of the disclosure can be implemented and/or supplied and/or used independently.

In this specification the word 'or' can be interpreted in the exclusive or inclusive sense unless stated otherwise.

The invention may extend to methods and/or apparatus substantially as herein described with reference to the accompanying drawings in which:

Figure 1 is an example of an existing airport arrangement;
Figures 2 are examples of a runway arrangement;
Figures 3 show the operation of an exemplary runway arrangement ;
Figure 4(a) shows the runway arrangement of Figures 3(a) and (c) together;
Figure 4(b) shows the runway arrangement of Figures 3(b) and (d) together;
Figures 5 show steps in an example method of expanding a runway arrangement;
Figures 6 show alternative steps of expanding a runway arrangement to that shown in Figure 5(d);
Figures 7 show an example landing approach which can be used with the runway arrangements of Figures 2 to 4;
Figures 8 (a) shows another example landing approach which can be used with the runway arrangements of Figures 2 to 4; and
Figure 8(b) shows the landing approaches shown in Figures 7 and 8(a) combined.

Specific description

The term ‘runway’ used in this description preferably refers to an area designated and certified by the regulatory and safety authorities for use by an aircraft for taking-off and/or landing. Typically, this is a suitably hard surfaced area which is demarcated (i.e. distinct to taxiways etc.) as a runway.

In the description below the term ‘longitudinal length’ or ‘length’ preferably refers to the length of the runway along which an aircraft typically moves when landing or taking-off. The term ‘lateral width’ or ‘width’ preferably refers to the width of the runway, or group of runways (depending on context), measured perpendicularly to the longitudinal length.

$$\Delta d = (x - a) \cdot (\tan 5° - \tan 3°)$$
$$\approx 0.035 \cdot (x - a)$$

Where (x-a) is the distance the point of measurement (i.e. the population) is from the point the angle of approach changes (in km).

The combination of the 'long landing' described above and a staged descent means that the noise over a nearby population is significantly reduced; however each of these could be provided independently depending on the situation. Figure 8(b) shows an example landing utilising both the staged approach and the 'long landing' described above. The extra height an aircraft is at, at a distance 'x' from the landing point, is given by:

$$\Delta d = (x - a) \cdot (\tan 5° - \tan 3°) + \Delta x \cdot \tan 3°$$
$$\approx 0.035 \cdot (x - a) + 0.052 \cdot \Delta x$$

For a population 10km away from the usual landing point, and where the angle of approach changes 3km from landing; moving the landing point 2km further means the aircraft are around 350m higher up over the population. This extra height corresponds to a significant reduction in aircraft noise at ground level.

The angle of approach may change closer or further away than the 3km example given above. This may depend on factors such as local regulations and the precise location of the population.

The angles of approach changing from 5^0 to 3^0 is an example step change. A person skilled in the art would realise that a range of differing approach angles could be used depending on the type of aircraft, the airport, the nature of the flight etc. Furthermore, the change may not be a step change; it may be a gradual change from one approach angle to another over a significant distance.

Alternatives and modifications

Although the above description refers to many examples where an airport runway arrangement has two parallel runways, the techniques disclosed herein extend to situations where there is a single runway. This would be particularly advantageous in an urban environment where there is only space for a single runway. Furthermore, the techniques disclosed herein can also be applied to airports with more than one non-parallel runway. This would be particularly advantageous

in order to increase passenger capacity in situations where non-parallel runways are independently used depending on wind conditions or where space constraints require runways to be non-parallel.

The above description includes numerous references to runway and airport configuration dimensions. These dimensions are merely examples and a person skilled in the art would appreciate that these are dependent on factors such as type of aircraft and the regulations covering the airport. Such modifications could be made by a person skilled in the art and therefore are within the scope of the appended claims as appropriate.

Various other modifications will be apparent to those skilled in the art and will not be described in further detail here.

It will be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the appended claims.

Reference numerals appearing in the claims are by way of illustration only and shall have no limiting effect on the scope of the claims.

Claims

1. An airport runway arrangement for commercial aircraft, comprising:

   a first runway section;

   a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section; and

   an intermediate section between the first and second runway sections;

   wherein the intermediate section is designated as an intermediate safety area, said designation indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement;

   thereby simultaneously allowing a landing aircraft to land on one of said first and second runway sections, and a departing aircraft to take off from the other of said first and second runway sections, whilst not using the intermediate section.

2. An airport runway arrangement according to claim 1 further comprising a landing aircraft and a departing aircraft.

3. An airport runway arrangement according to claim 1 or 2 wherein the first runway section is designated a landing runway section and the second runway section is designated a take-off runway section.

4. An airport runway arrangement according to claim 3 further comprising a safety area at the end of said take-off runway section.

5. An airport runway arrangement according to claim 3 or 4 further comprising a safety area at the start of said landing section.

6. An airport runway arrangement according to claim 4 or 5 wherein such safety areas are at least 200m in length.

7. An airport runway arrangement according to claim 1 wherein the intermediate safety area is between 240m and 300m or 600m in length.

8. An airport runway arrangement according to any preceding claim wherein the designation of said intermediate section comprises at least one of lights, markings and reflectors on said runway arrangement.

9. An airport runway arrangement according to any preceding claim wherein the first and second runway sections are substantially the same length.

10. An airport runway arrangement according to any of the preceding claims wherein each runway section is between 1000m and 8000m long.

11. An airport runway arrangement according to claim 10 wherein each runway section is between 1000m and 4000m, preferably between 2200m and 3200m long.

12. An airport runway arrangement according to any of claims 1 to 8 wherein the first and second runway sections are of different lengths.

13. An airport runway arrangement according to claim 12 wherein one runway section is between 1000m and 2500m long and the other runway section between 2500m and 4000m long.

14. An airport runway arrangement according to any preceding claim wherein the intermediate section is between 175m and 1500m in length.

15. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 180m and 1500m in length.

16. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 200m and 1500m in length.

17. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 240m and 1500m in length.

18. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 300m and 1500m in length.

19. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 600m and 1500m in length.

20. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 540m and 660m in length.

21. An airport runway arrangement according to claim 20 wherein the intermediate section is approximately 600m in length.

22. An airport runway arrangement according to any of the preceding claims wherein a terminal area is situated adjacent the intermediate section.

23. An airport runway arrangement according to any of the preceding claims further comprising a further runway arrangement.

24. An airport runway arrangement according to claim 23 wherein said further runway arrangement is parallel to said first and second runway sections.

25. An airport runway arrangement according to claim 23 or 24 comprising a pair of runway arrangements each according to any of the preceding claims.

26. An airport runway arrangement according to claim 25 wherein the pair of runway arrangements are substantially parallel to each other.

27. An airport runway arrangement according to claim 25 or 26 wherein the pair of runway arrangements formed by the further runway section and said first and second runway sections parallel thereto is separated by at least 1035m.

28. An airport runway arrangement according to any of claims 23 to 27 wherein the further runway arrangement comprises a landing runway section.

29. An airport runway arrangement according to claim 28 when dependent on claim 3 wherein the landing runway section on the further runway arrangement is longer than the landing runway section of said first runway section.

30. An airport runway arrangement according to any of the preceding claims further comprising at least one taxiway adjoining the intermediate section.

31. An airport runway arrangement according to any of the preceding claims, being for commercial passenger carrying aircraft.

32. An airport runway arrangement according to any of the preceding claims, being for aircraft operating under civil regulations.

33. A method of operating an airport runway arrangement for commercial aircraft, the method comprising the steps of:

providing a first runway section;

providing a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section;

providing an intermediate section between the first and second runway sections, the intermediate section being designated as an intermediate safety area, said designation

indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement; and

simultaneously landing an aircraft on one of said first and second runway sections, and taking off an aircraft from the other of said first and second runway sections, whilst not using the intermediate section.

34. A method of directing aircraft to or from a commercial airport runway arrangement, said runway arrangement comprising a first runway section, a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section, and an intermediate section between the first and second runway sections, the intermediate section being designated as an intermediate safety area, said designation indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement,

said method comprising simultaneously directing a landing aircraft to land on one of said first and second runway sections, and a departing aircraft to take off from the other of said first and second runway sections, whilst not using the intermediate section.

35. A method according to claim 33 or 34, using the runway arrangement of any of claims 1 to 32.

36. A system incorporating an airport runway arrangement according to any of claims 1 to 32, and further comprising:

means for defining the first runway section;

means for defining the second runway section.

37. A system according to claim 36 wherein the means for defining comprises marking the runway sections.

38. A system according to claim 37 wherein the marking comprises at least one of lights, painted markings and reflectors.

39. A system according to any of claims 36 to 38 wherein the means for defining comprises means for communicating the definitions of the sections.

40. A system according to claim 39 comprising means for communicating the definitions of the sections to a user such as a pilot or an air traffic controller.