

Creation of FSE runways

The files mentioned refer to files packed with the application xFseRunwayData.

The csv file [FseRunways.csv](#) contains the original data of all Fse runways (= MSFS data). However, the file had several issues that needed to be addressed before the data could be processed. A new csv file is generated with all corrections: [CorrectedFSERunways.csv](#). Using this file the runways for FSE are created.

Taxiways

The taxiways are created on the right side of each runway. The surface is the same as the runway.

Runway lighting

The following choices are made:

Runway lights	Asphalt, concrete	Grass, dirt, etc	Transparent
Shoulder	0, no	0	0
Center lights	1, yes	0	0
Edge lights	2, yes	2	0
Auto signs	1, yes	1	0
Markings	2, non-precision	1, visual	0
Approach lights	10, MALS	0, no	0
TDZ lights	1, yes	0, no	0
Runway End ID (REIL)	1, omni-directional	0, no	0

Sorting of runways

X-Plane only uses numeric runway names (+ L, R or C). Some runways in the file are not named based on their heading, but have a code ranging from 37 till 44. The meaning of these codes:

Code	Meaning	Translation
37	N	36
38	NE	05
39	E	09
40	NW	32
41	S	18
42	SW	23
43	W	27
44	SE	14

Some ICAO's name their North/South and use 18/36 at the same time, resulting in a conflict. This is corrected for 70A7 and LA40.

X-Plane expects the runway data in pairs -> opposite heading on the same line. To accomplish this, the runways in the csv file had to be paired.

For this the runway name is used (using the heading causes problems with parallel runways). Based on the name the name of the opposite runway can be calculated (using the modulo method).

Translation of runway types

Labels	Number of runways	X-Plane runway surface code
Asphalt	22.201	1
Bituminous	820	1
Brick	2	2
Clay	122	3
Concrete	4.011	2
Coral	66	4
Dirt	2.731	4
Grass	19.576	3
Gravel	2.630	5
Ice	6	14
Macadam	340	4
Mats	6	4
Oil-treated	26	4
Planks	8	4
Sand	336	4
Shale	74	4
Snow	8	14
Tarmac	326	1
Unknown	40	4
Water	1.829	13
Eindtotaal	55.158	

NB: a lot of waterrunways are not waterrunways ! -> 489 real waterrunways

For an explanation of all MSFS runway types: see the end of this document.

Runway width

There is no data on runway width. The width is calculated as $\text{Runway Length} * 0,3048$ (feet to meters) / 40, with a minimum of 20m and a maximum of 100m.

Water runways

For the water runways only the center point is given. For the bearing, width and length a fictive figures are used: 0 and 180 degrees + 100 meter x 100 meter. Coordinates are calculated based on this assumptions. NB: in the original csv file the latitude and longitude of the center points are switched!

Several of the water runways in the FSE file are normal (mostly grass) runways according to the FSE website. This is corrected by cross checking the runway type with the ICAO type as listed in the ICAO database downloaded from FSeconomy.com.

BUT: after this check there are still runways marked water that are definitely not water runways (-> error in the Fseconomy list as well). It seems that these are originally helipads of MFSF. As the data matches the Fseconomy data and there is no way to correct these automatically, no further action is taken.

Errors

In the csv file there are 23 non water runways where just 1 line is present. This means that one side of the runway is missing. This is repaired similar to the way water runways are processed.

NB: not all the ICAO's involved will be needed for the final zzzz_FSE file (ICAO could already be present in the X-Plane file).

End of File

Problem: .NET does not recognize the end of file properly. There is a 'SUB' character at the end -> has to be removed and replaced with CrLf (just 'enter'). This can for instance be done with NotePad++.

The file in the directory of the application is already corrected and works fine.

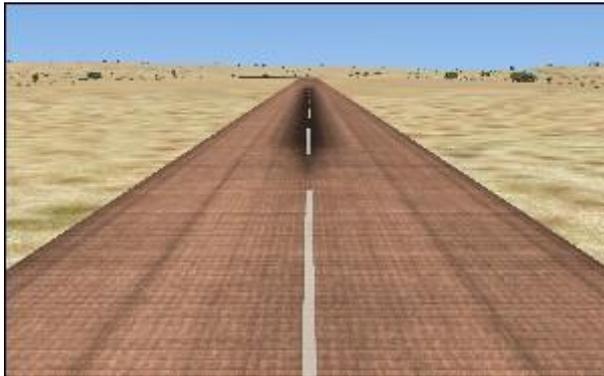
Before:

```
55158 ZYYJ, Yanji, Yanji, 129.448334, 42.881668, 623, -9, 09, 8516, 90.98, Concrete, 108.70, 42.880035, 129.432556 CRFB  
55159 ZYYJ, Yanji, Yanji, 129.448334, 42.881668, 623, -9, 27, 8516, 270.98, Concrete, , 42.883293, 129.464111 SUB
```

After:

```
55158 ZYYJ, Yanji, Yanji, 129.448334, 42.881668, 623, -9, 09, 8516, 90.98, Concrete, 108.70, 42.880035, 129.432556 CRFB  
55159 ZYYJ, Yanji, Yanji, 129.448334, 42.881668, 623, -9, 27, 8516, 270.98, Concrete, , 42.883293, 129.464111 CRFB  
55160
```

Runway surfaces Microsoft Flightsimulator



Flight Simulator X supports 20 different runway surfaces. The runways in the default scenery are covered by 19 of these surfaces. This page lists the different surfaces. The surfaces are divided into the categories: Hard, soft, snow/ice, and water.

Hard

Hard runways are paved and for aircrafts with conventional landing gear.

Asphalt

Asphalt is the most common hard surface covered by 38% of all runways.



Concrete

Concrete is covered by 6% of all runways and is found world-wide. Examples: UWLW, KEDW, EPPW, VYMD, FZAA.

Soft

Soft runways are unpaved and for aircrafts with conventional landing gear.

Grass

Grass is the most common surface covered by 39% of all runways.



Gravel

Gravel is covered by 5% of all runways and is found world-wide. Examples: 97TX, SSBR, OYBD, VI66, NCPY.



Bituminous

Bituminous is covered by 1.4% of all runways and is found world-wide. Examples: WSSS, LICJ, HKJK, VYTO, GMMN.



Tarmac

Bituminous is covered by 0.5% of all runways and is found world-wide. Examples: HCMI, HTKJ, LFPB, WMKD, VEIM.



Cement

Cement is a supported surface but none of the default runways have this surface.

Snow and ice

The few snow and ice runways are all located far north and south. The runways require aircrafts to be equipped with skis.

Ice

4 runways are covered by ice: 74AK, NZIR, NZPG.



Dirt

Dirt is covered by 5% of all runways and is found world-wide. Examples: KEDW, LESA, HCMN, GQNC, Z12E.



Macadam

Macadam is covered by 0.6% of all runways and is found world-wide. Examples: DIAP, LFRB, EPKS, RPMU, GATB.



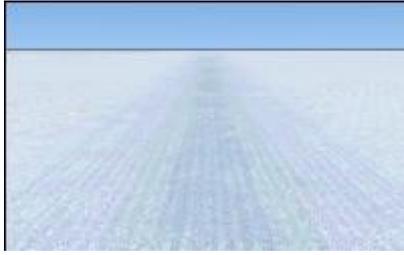
Sand

Sand is covered by 0.6% of all runways and is found world-wide. Examples: ORBD, SSSG, EGCO, CYGW, S16.



Turf/clay

Turf is covered by 0.3% of all runways and is found world-wide. Examples: SPNP, SNOA, SYLP, YIMB, CET2.



Snow

6 runways are covered by snow: CTE5, NZSP, NZWD, SA47, NZ12.



Water

Water runways don't have physical markings, but they indicate that you have a certain straight out distance available for takeoffs and landings in seaplanes.

2.3% of all runways are water runways and they are only present in US territories.

[Lake Hood Seaplane Base \(PALH\)](#), Alaska, USA, is claimed to be the world's busiest seaplane base and is probably the best modeled seaplane base in FS.



Oil treated

Oil treated is covered by 0.2% of all runways and is found mostly in the USA. Examples: 34CN, CA40, CEX5, ERU, SPRM.



Coral

Coral is covered by 0.1% of all runways and is found world-wide. Examples: RODE, PHFS, YTTI, NGFU, MYE4.



Shale

7 runways in Brazil are covered by shale: SWPB, SWOW, SNYA, SWAI, SNAI, SNPB, SNMI.



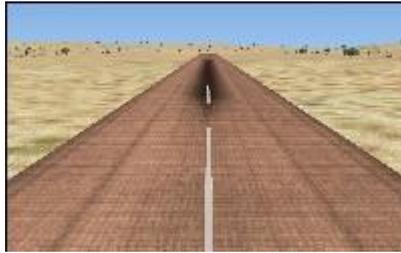
Planks

6 runways are covered by planks: NXP, 9OA3, VVDB, VVNS, Z19N, AYKK.



Brick

A single brick runway is found at Mao (FTTU) in Chad.



Steel mats

A single steel mat runway is found at Bogue MCALF (KNJM) in Swansboro, North Carolina, USA.

