

COMPOSMENT
TPOLOGY
CONFIGURATION
AIRFIELDS
NORWAY

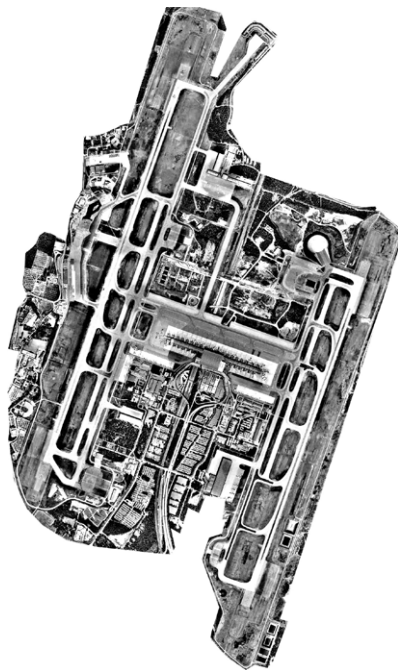
**Norwegian airports with more than
100 000 passengers**

*This airport research combines selected airports that with a certain annual passengers in Norway.
The methodology of juxtaposition, the analysis of Terminals, Runway, Airport cities patterns as well
as configuration, spatial, morphology, forms, which serve as a base-data for airport design.*

TPOLOGY OF AIRPORTS - NORWAY

SELECTED AIRPORT ANALYSIS & STUDY

<i>Oslo</i>	3
<i>Bergen</i>	5
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<i>Sandefjord</i>	13
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<i>Haugesund</i>	21
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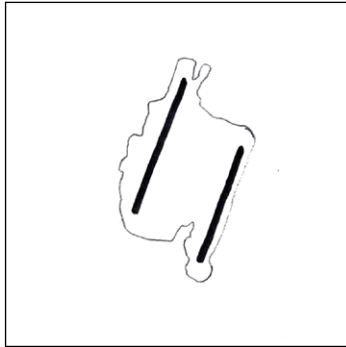


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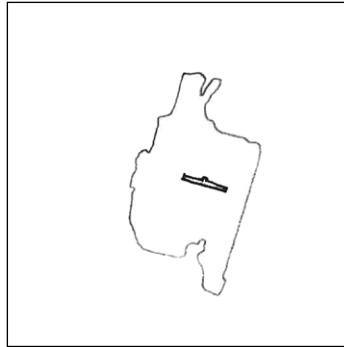
60°12'10"N 011°05'02"E

Airport type	Public
Operator	Oslo Lufthavn AS
Serves	Oslo, Norway
Location	Gardermoen, Ullensaker, Akershus
Runways	3,600/2,950
Passengers	25,788,610
International	14,567,406
Domestic	11,221,204
Aircraft movements	237,618
Cargo (tonnes)	130,301

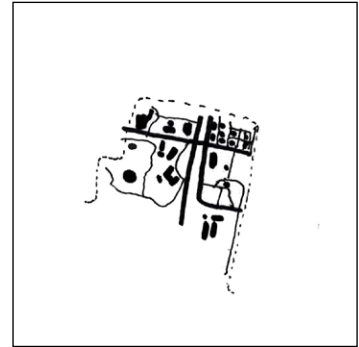
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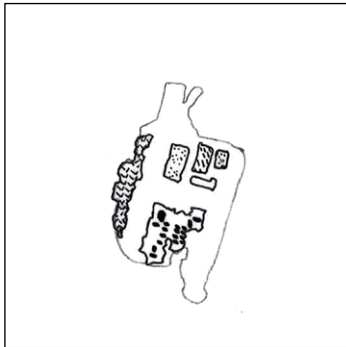
RUNWAY



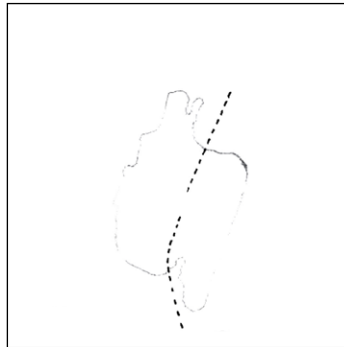
TERMINAL



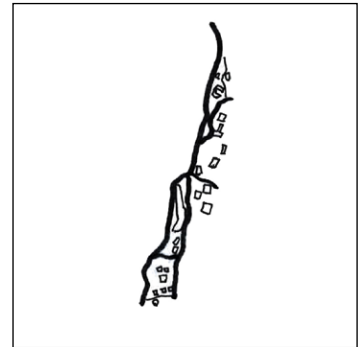
AIRPORT CITY STRUCTURE 1



AIRPORT CITY PATTERN



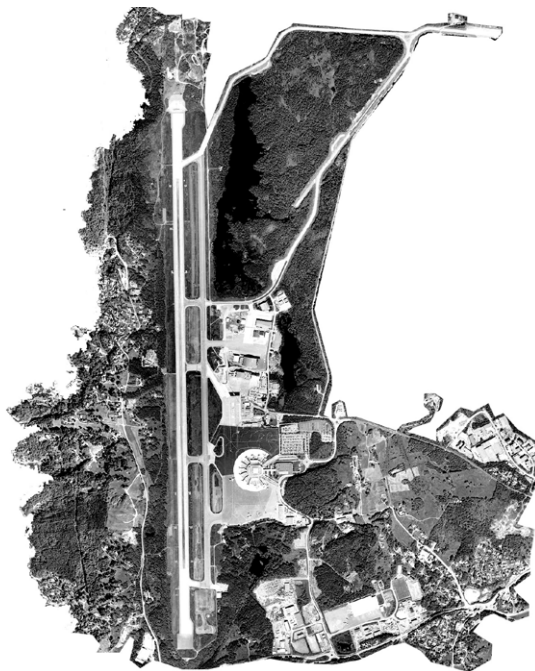
TRANSFER



AIRPORT CITY PATTERN



The first airports to serve Oslo was Kjeller Airport that opened in 1912 and Gressholmen Airport that served seaplanes after its opening in 1926. The airport location was first used by the Norwegian Army from 1940, with the first military airport facilities being built during the 1940s. An expansion with a new terminal building and a third pier is scheduled to open in 2017. Oslo Airport is the largest and busiest of three major international airports located around Oslo.

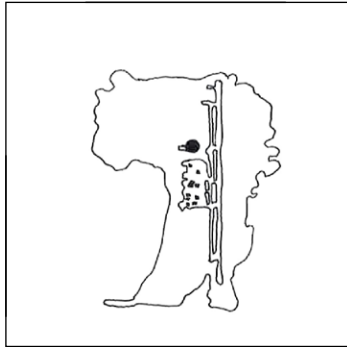


BGO

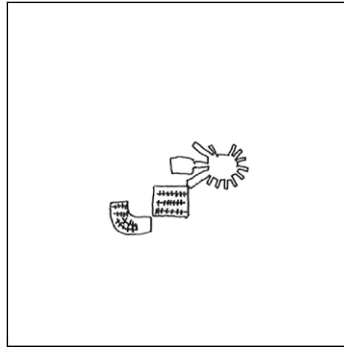
60°17'37"N 005°13'05"E

Airport type	Public
Operator	Avinor
Serves	Bergen, Norway
Location	Flesland, Bergen, Hordaland
Runways	2,990
Passengers	6,021,020
Aircraft movements	101,456
Cargo (tonnes)	8,186

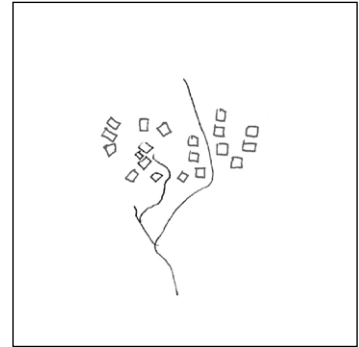
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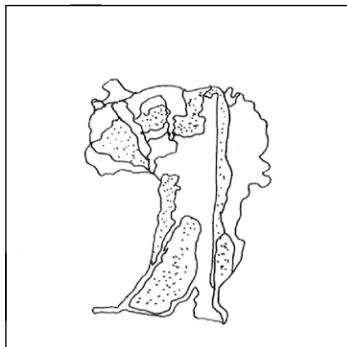
RUNWAY



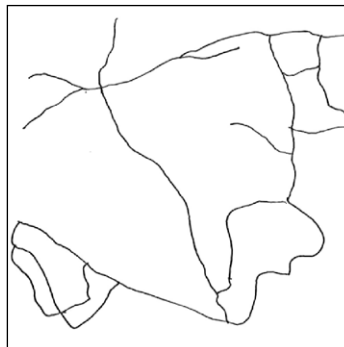
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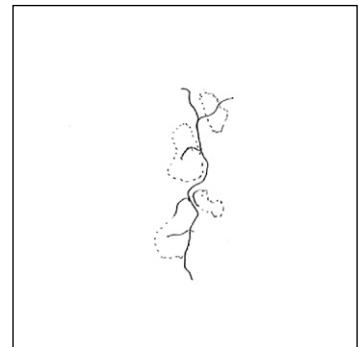
AIRPORT CITY STRUCTURE 1



AIRPORT CITY PATTERN



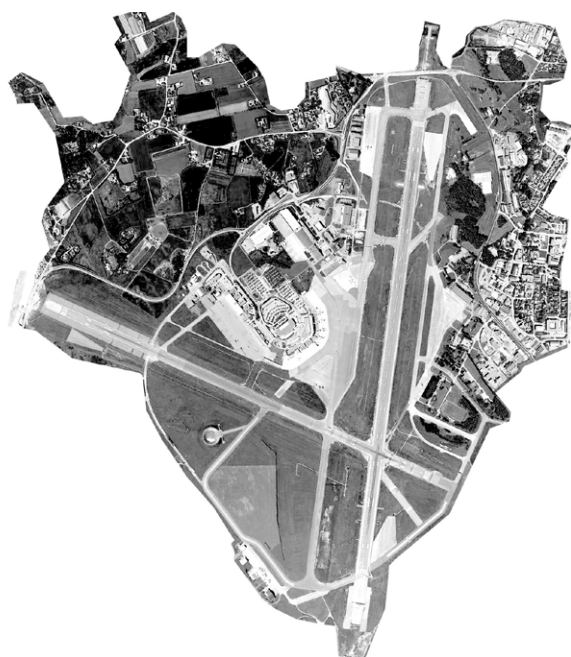
AIRPORT CITY CIRCULATION



AIRPORT CITY PATTERN



Originally Bergen was served by water aerodromes at Flatøy, Sandviken and Herdla. Financing of Flesland was largely secured through NATO funds and the airport opened on 2 October 1955. Until the 1980s, Bergen was the Norwegian airport used for SAS' intercontinental flights to New York. A new terminal opened in 1988. The terminal is too small for today's traffic. A new terminal is scheduled for completion in 2017, by which time Bergen Light Rail will have been expanded to the airport.

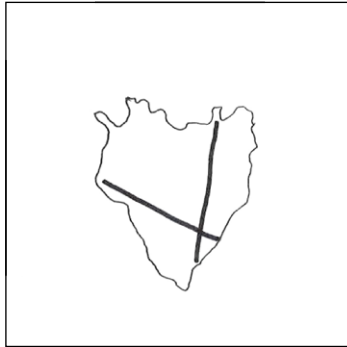


SVG

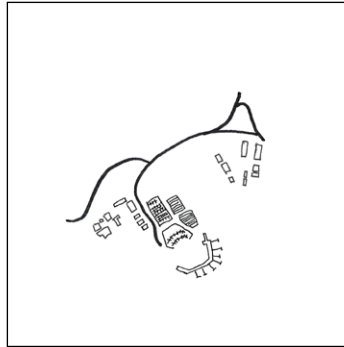
58°52'36"N 005°38'16"E

Airport type	Public
Operator	Avinor
Serves	Stavanger, Norway
Location	Sola, Rogaland
Runways	2,556/2449
Passengers	4,501,368
Aircraft movements	85,306
Cargo (tonnes)	5,018

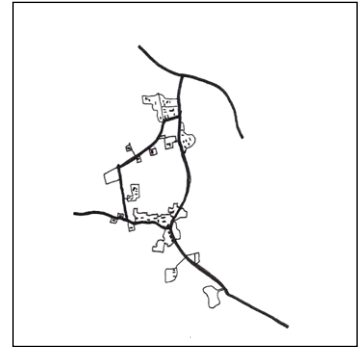
SVG



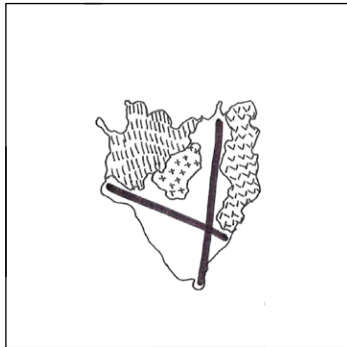
RUNWAY



TERMINAL



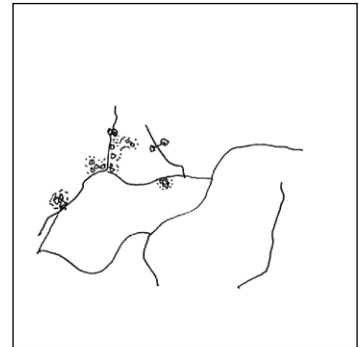
AIRPORT CITY STRUCTURE 1



AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 2

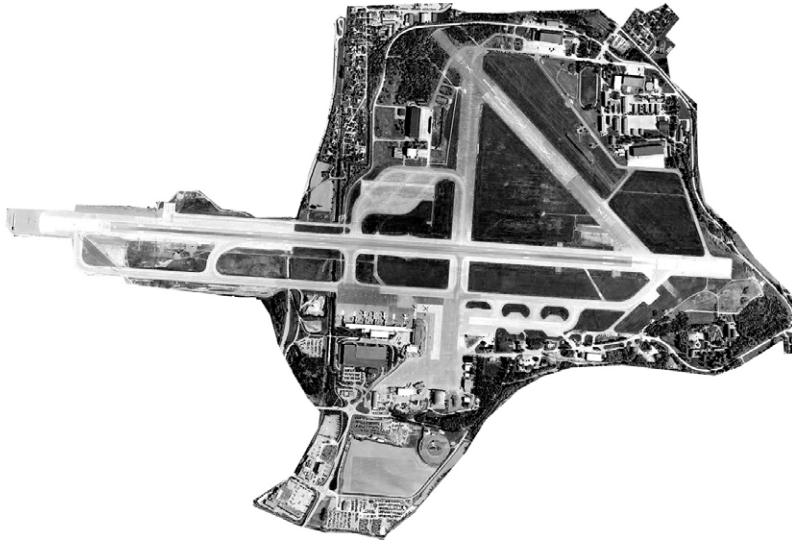


AIRPORT CITY STRUCTURE 3



Stavanger Airport has two passenger terminals, one for airplanes and one for helicopters. When the present terminal was put into use 28 January 1987, it was the first airport in Norway to have jet bridges, nine in total. The old terminal was then converted into a heliport.

Expansion of the airplane terminal took place in 2009. The new gates were built without jetbridges. The airport's two largest airlines, SAS and Norwegian, showed little interest in such amenity and desired quicker turnaround times. SAS though later said that they did want jetbridges for their larger jet aircraft, and only wanted gates without jetbridges for their smaller turboprop aircraft.

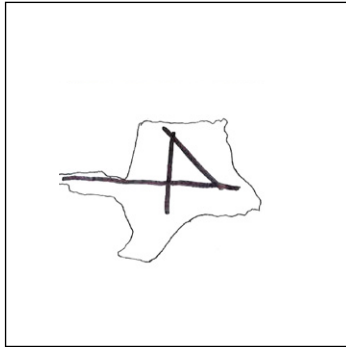


TRD

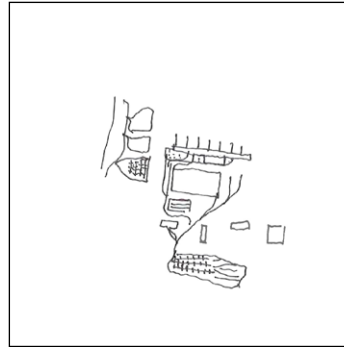
63°27'27"N 010°55'27"E

Airport type	Public/military
Operator	Avinor
Serves	Trøndelag, Norway
Location	Værnes, Stjørdal, Nord-Trøndelag
Runways	2,999
Passengers	4,416,681
Aircraft movements	60,934
Cargo (tonnes)	5,383,158

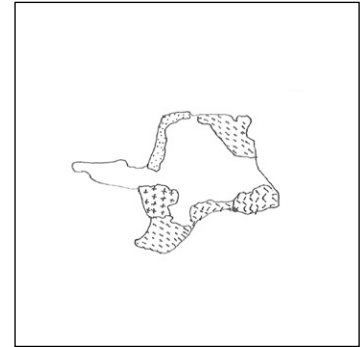
TRD



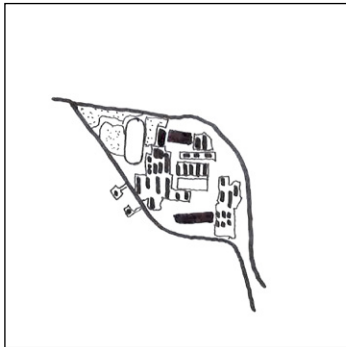
RUNWAY



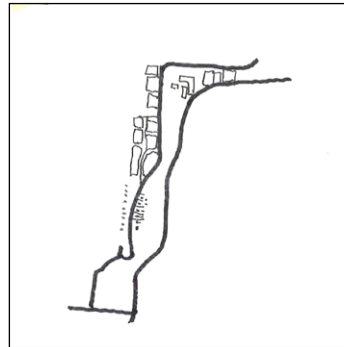
TERMINAL



AIRPORT CITY STRUCTURE 1



AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 2

Trondheim Airport is a joint military and civilian airport located in the municipality. The terminal has stands for 24 aircraft, of which eight of sixteen at Terminal A have jetbridges. Four stands (two at each terminal is size code D (large enough for an Airbus A330 or a Boeing 757), while 20 are for size category C (large enough for an Airbus A320 or Boeing 737). Domestic jets normally use the seven jetbridge stands (gates 30–37), while the five non-bridged gates at Terminal A (gates 25–29) are used for domestic regional aircraft. International flights all use the eight non-bridged gates at Terminal B.

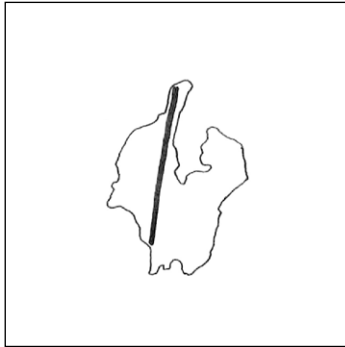


TOS

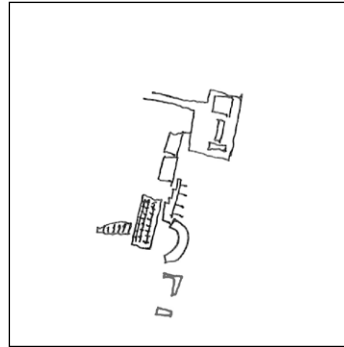
69°40'53"N 018°55'04"E

Airport type	Public
Operator	Avinor
Serves	Tromsø, Norway
Location	Langnes, Tromsøya, Tromsø
Runways	2,447
Passengers	2,009,146
Aircraft movements	42,444
Cargo (tonnes)	2,758

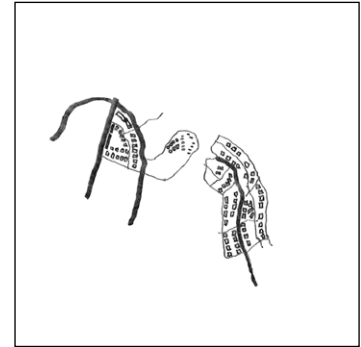
TOS



RUNWAY



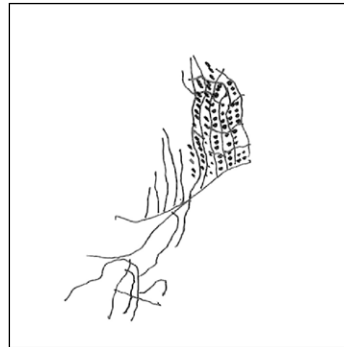
TERMINAL



AIRPORT CITY STRUCTURE 1



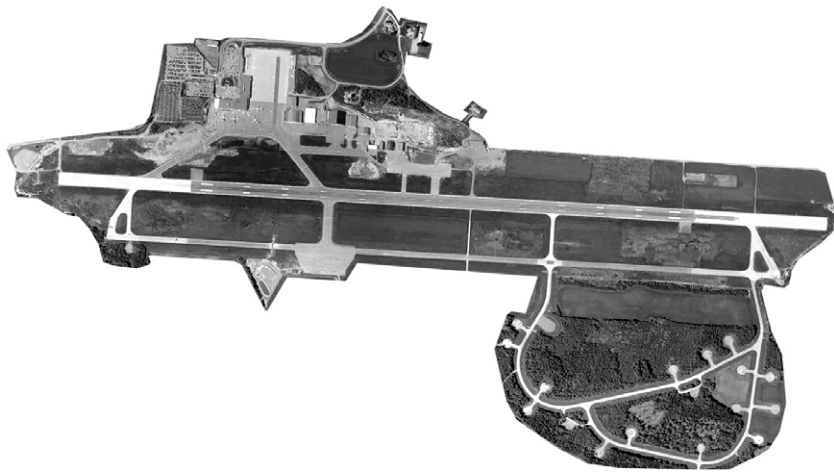
AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 2



The first airport in Tromsø was a water aerodrome located at Skatterø, located in the then separate municipality of Tromsøysund. It was established in the 1930s and was at first served by Norwegian Air Lines (DNL). During World War II it was taken over by Luftwaffe and the aerodrome was expanded. A new seaplane route was established by DNL in 1946 with a daily service to Trondheim using a Junkers Ju 52, which after a few months was extended northwards to Kirkenes.

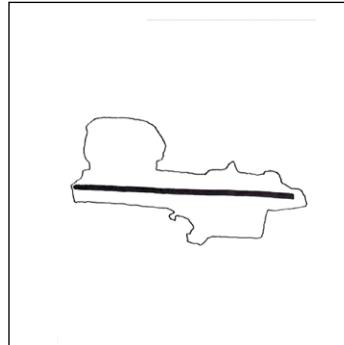


TRF

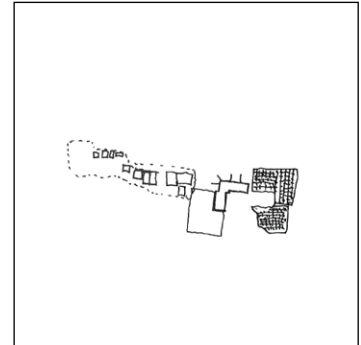
59°11'12"N 010°15'31"E

Operator	Sandefjord Lufthavn AS
Serves	Sandefjord, Norway
Location	Sandefjord and Stokke, Vestfold
Runways	2,989
Passengers	1,542,541
Aircraft movements	42,139
Cargo (tonnes)	23

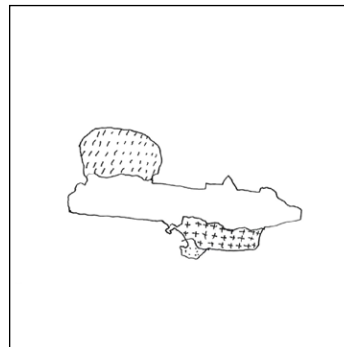
TRF



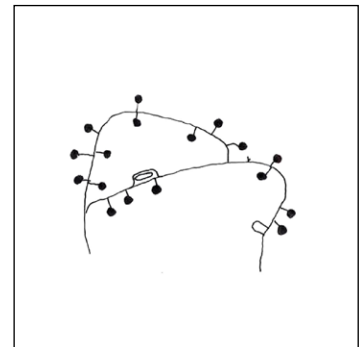
RUNWAY



TERMINAL

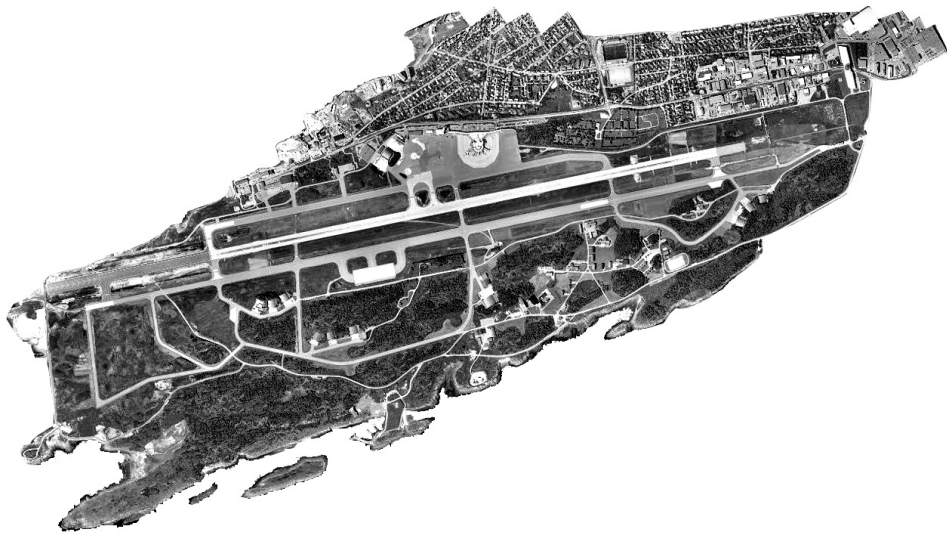


AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 2

The airport was built largely with NATO funding as one of several bases to be used by the United States Air Force in case of war. The new owners concluded that the airport needed a new control tower and a new terminal building. Construction was issued as a public tender in 1987, but the military decided to stop the plans. At this time, a debate about a new location for Oslo Airport had started. One of the proposals was to use Gardermoen, one of the two permanently used air stations in Eastern Norway.

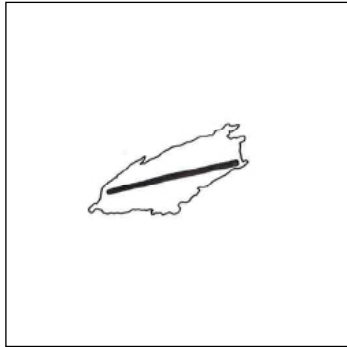


BOO

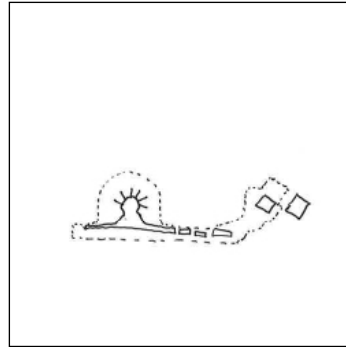
67°16'09"N 014°21'55"E

Airport type	Joint (public and military)
Operator	Avinor
Serves	Bodo, Norway
Location	Bodo
Runways	2,794
Passengers	1,733,330
Air movements	42,902
Cargo (tonnes)	2,273 (2,014)

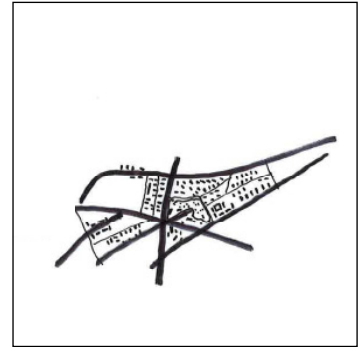
BOO



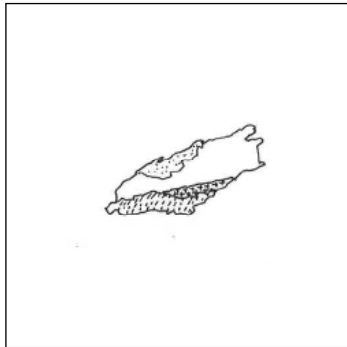
RUNWAY



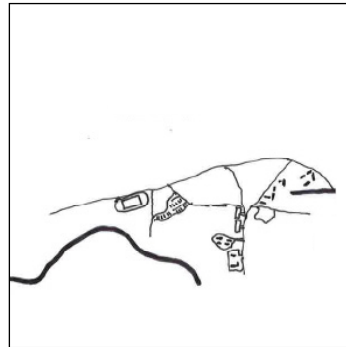
TERMINAL



AIRPORT CITY STRUCTURE 1



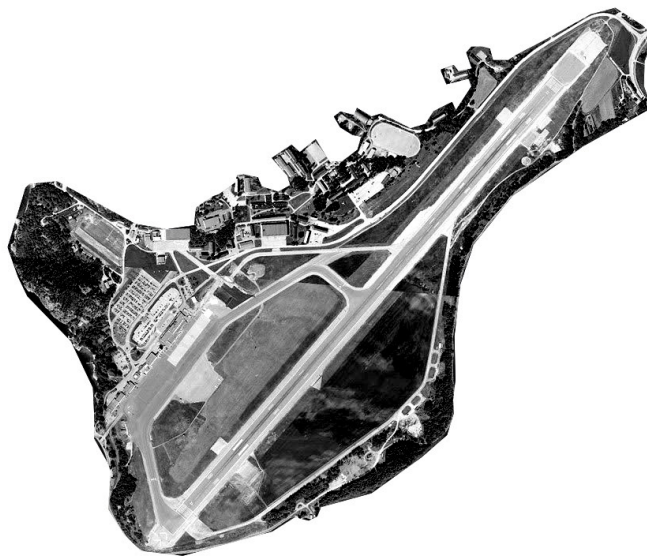
AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 2



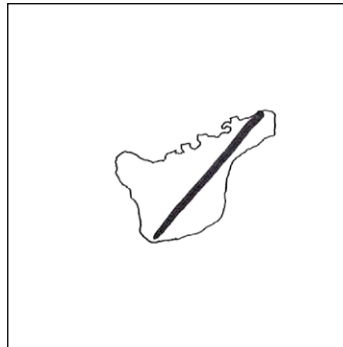
Postal flights to Bodø started in 1921, and before 1940 Bodø was served with sea planes from Widerøe. In early 1980s the current civilian terminal were discussed and planned. The Norwegian Ministry of Finance approved the project early in 1988. The construction started few week after its approval and were completed spring 1990. The terminal has 11 gates, 3 with jetways. Since its opening in 1990, the number of passengers has mainly increased from 820,000 to 1,700,000 in 2013.



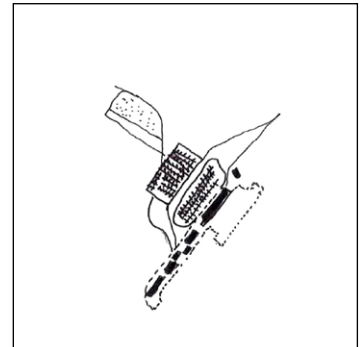
KRS

58°12'14"N 008°05'06"E

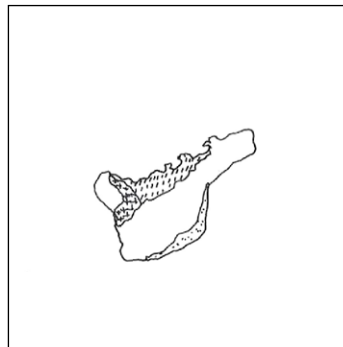
Airport type	Public
Operator	Avinor
Serves	Kristiansand, Norway
Location	Kjevik, Tveit, Kristiansand, Vest-Agder
Runways	2,035
Passengers	1,065,638
Aircraft movements	19,465
Cargo (tonnes)	413



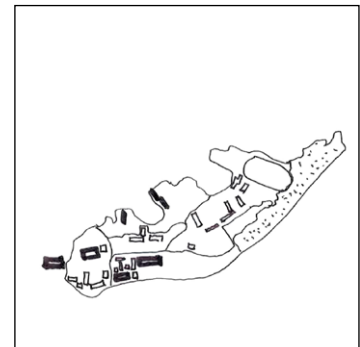
RUNWAY



TERMINAL

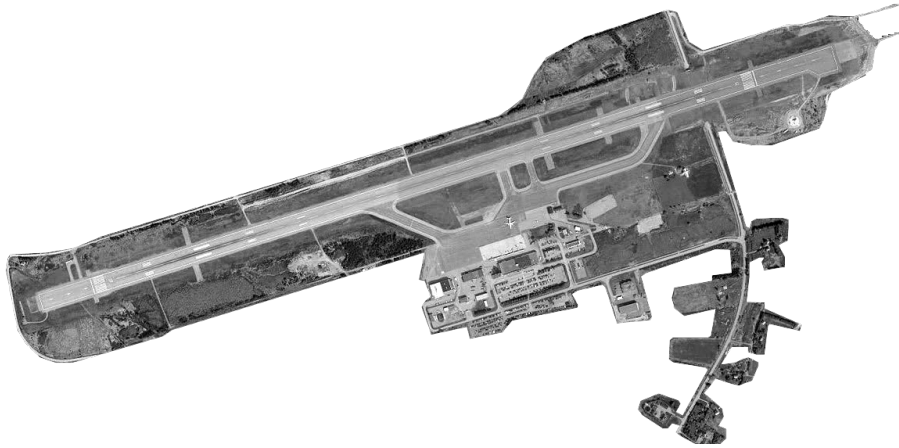


AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 2

Kjevik opened on 1 June 1939, as the joint second airport in the country. During the Second World War it was occupied and expanded by the Luftwaffe. Kristiansand's southerly location caused the airport to receive several international routes during the early years, as well as domestic services. The terminal received major extensions in 1955, 1979, 1994 and 2015. New control towers were built in 1966 and 2013. Kjevik was the base for Sørfly from 1946 to 1962, for Agderfly from 1969 to 2004, and for FlyNonstop in 2013.

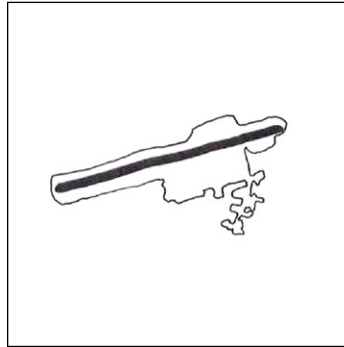


AES

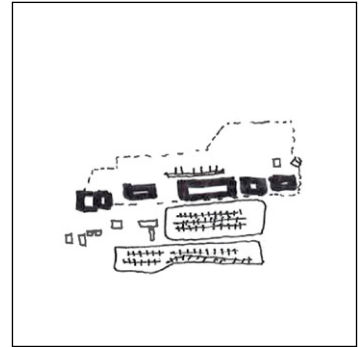
67°16'09"N 014°21'55"E

Airport type	Public
Operator	Avinor
Serves	Ålesund, Norway
Location	Vigra, Giske
Runways	2,314
Passengers	1,077,209
Aircraft movements	16,057
Cargo (tonnes)	641 (2,013)

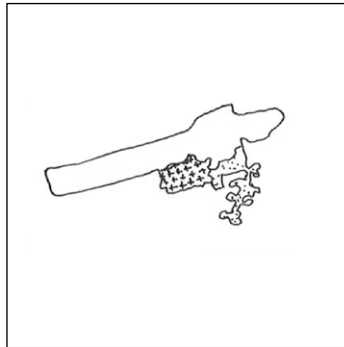
AES



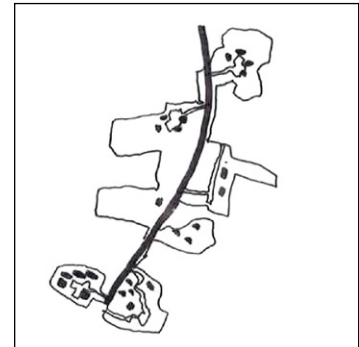
RUNWAY



TERMINAL

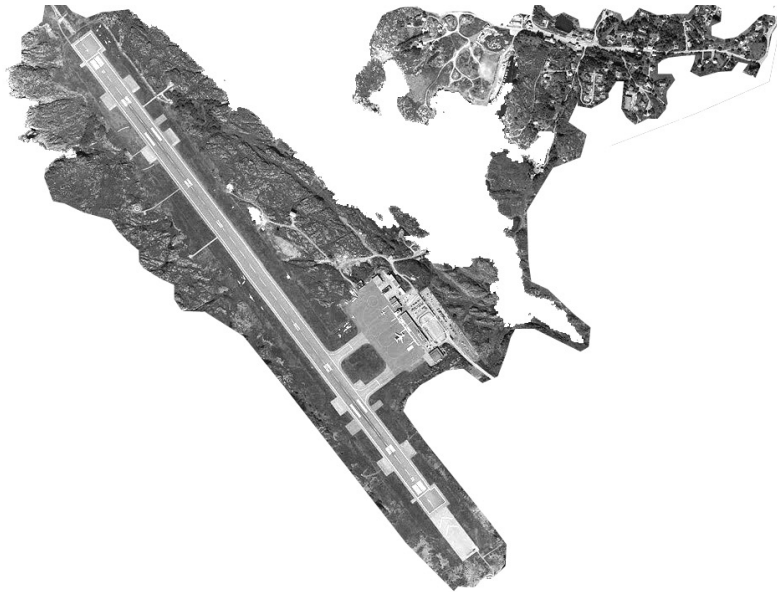


AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

International flights commenced in 1977 and a new terminal opened in 1986. The National Air Ambulance Service has operated out of the airport since 1988. The terminal was expanded in 2007 and since the airport has seen a series of international destinations.

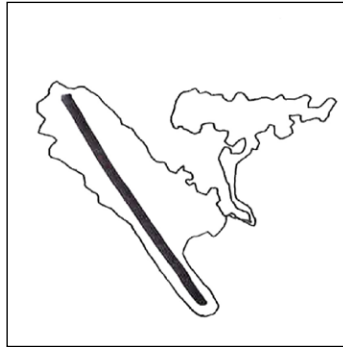


HAU

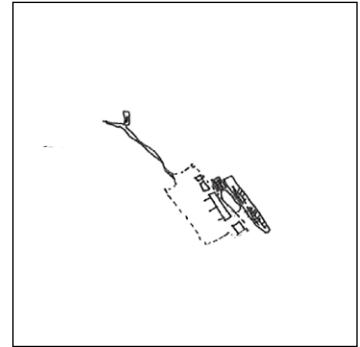
59°20'36"N 005°12'45"E

Airport type	Public
Operator	Avinor
Serves	Haugesund, Norway
Location	Helganes, Karmøy
Runways	2,120
Passengers	694,005
Aircraft movements	10,265
Cargo (tonnes)	234 (2,014)

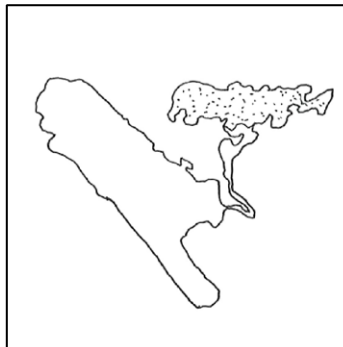
HAU



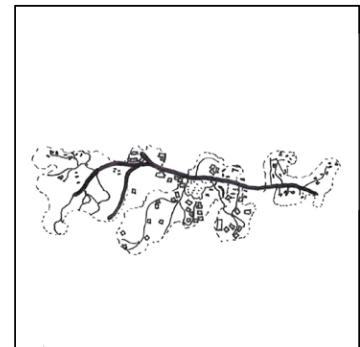
RUNWAY



TERMINAL



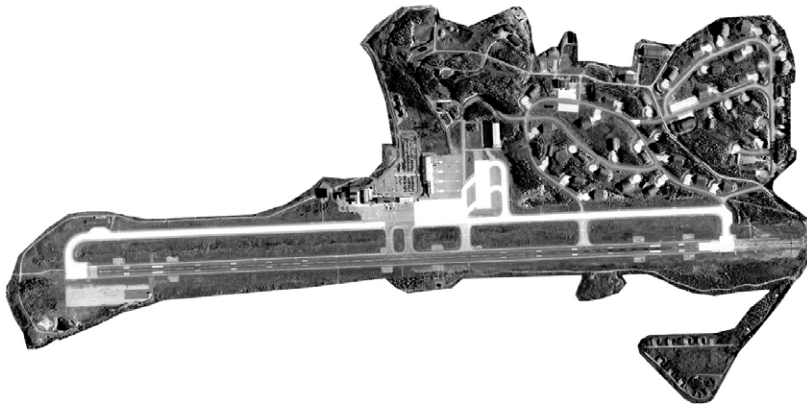
AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1



The airport opened on 8 April 1975. In addition to SAS flights to the capital, the airport has variously seen services by Nordsjøfly, Braathens SAFE, Busy Bee, Coast Aero Center, Coast Air Norwegian and SAS Commuter to smaller domestic destinations. A new international terminal opened in 1989. Except occasional routes to Aberdeen, regular international flights commenced in 1998. Ryanair started services in 2003, after which the runway was extended 400 meters (1,300 ft).

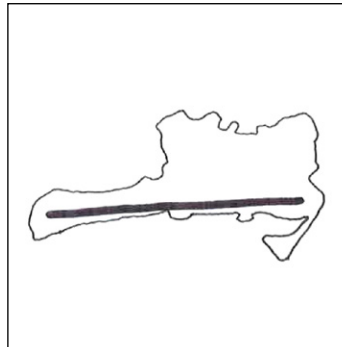


EVE

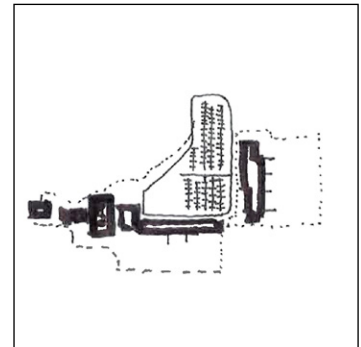
68°29'20"N 016°40'42"E

Airport type	Joint (public and military)
Operator	Avinor
Serves	Harstad and Narvik, Norway
Location	Evenes, Nordland, Norway
Runways	2,808
Passengers	692,532
Aircraft movements	10,636
Cargo (tonnes)	1,009

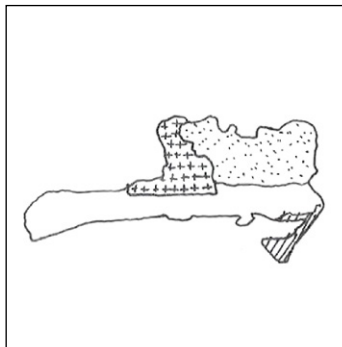
EVE



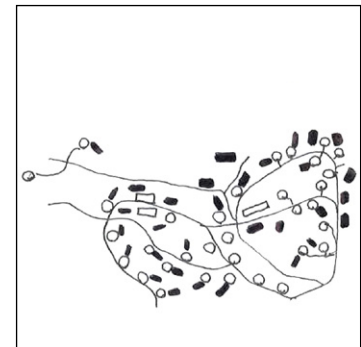
RUNWAY



TERMINAL



AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

Evenes opened on 30 June 1973, initially with a 1,600-meter (5,200 ft) runway. It was extended in 1977, after the military decided to establish the air station. SAS Commuter served Harstad/Narvik from 1990 to 2002, and from 1994 competition was introduced on the Oslo route with the entry of Braathens SAFE. Norwegian started services in 2003 and launched international scheduled services from 2013.

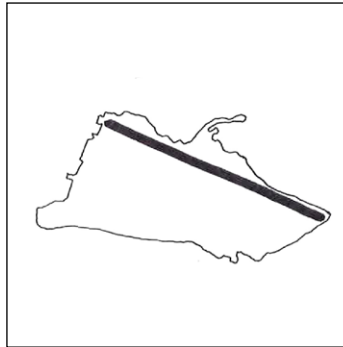


ALF

69°58'34"N 023°22'18"E

Airport type	Public
Operator	Avinor
Serves	Alta, Norway
Location	Elvebakken, Alta, Finnmark
Runways	2,253
Passengers	368,393
Air movements	11,707
Cargo (tonnes)	330

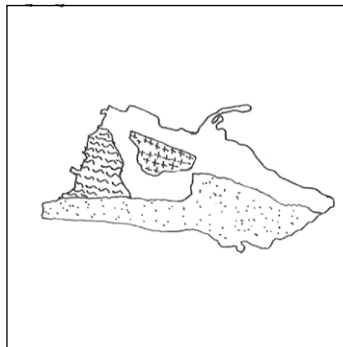
ALF



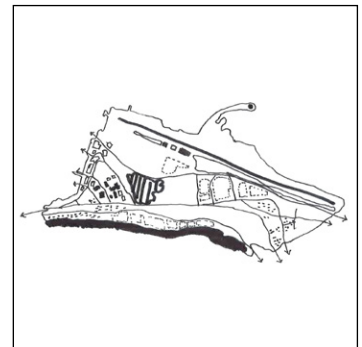
RUNWAY



TERMINAL-HABOUR



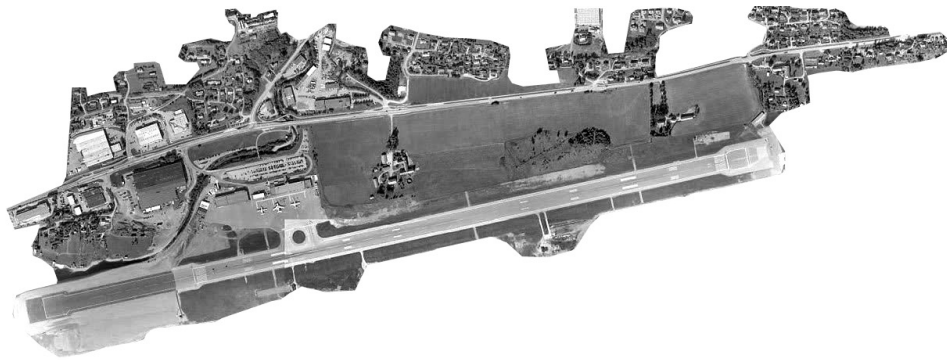
AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1



Alta Airport's regional importance increased in 1990, when it became a hub for the newly created SAS Commuter. Norwegian started flying to Alta in 2003 and a new terminal building was opened in 2009.

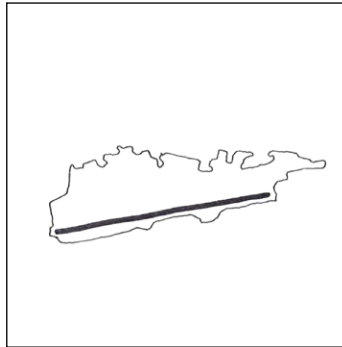


MOL

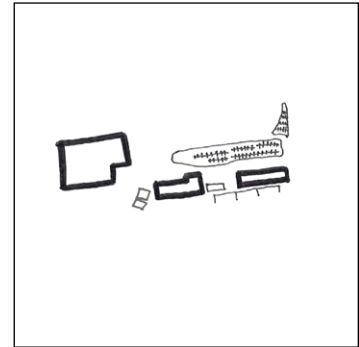
62°44'41"N 007°15'45"E

Airport type	Public
Operator	Avinor
Serves	Molde, Norway
Location	Årø
Runways	2,220
Passengers	481,406
Aircraft movements	9,412
Cargo (tonnes)	3,517

MOL



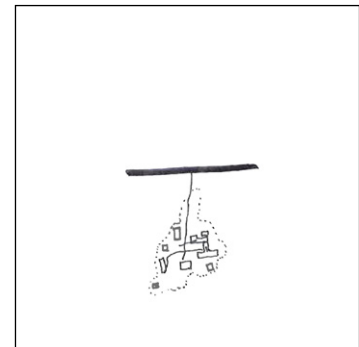
RUNWAY



TERMINAL

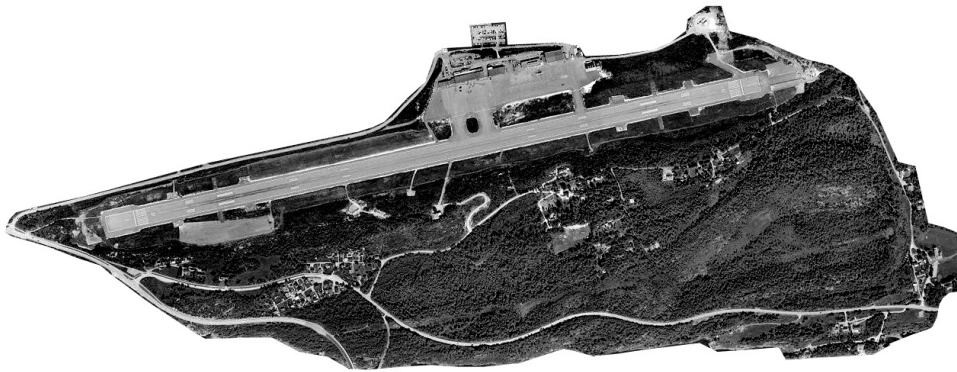


AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

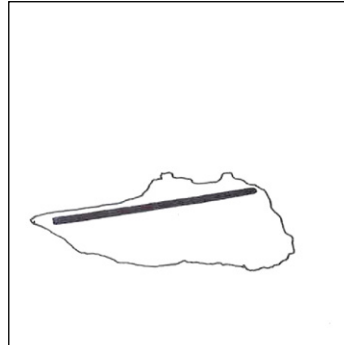
New or expansions of the terminals have taken place four times, in 1982, 1993, 2008 and 2012. Inclusive tour (IT) charters have been offered since 2004. However, there was some opposition to the plans. There were complaints that the airport was located too far from Kristiansund and Ålesund



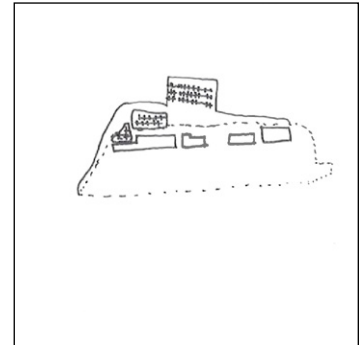
KSU

63°06'43"N 007°49'34"E

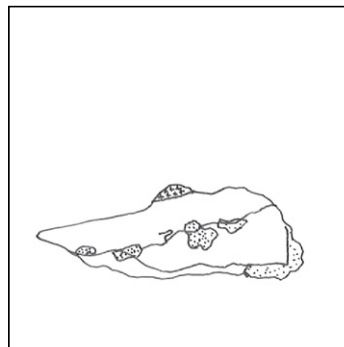
Airport type	Public
Operator	Avinor
Serves	Kristiansund, Norway
Location	Kvernberget, Nordlandet, Kristiansund
Runways	1,840
Passengers	384,822
Aircraft movements	13,722
Cargo (tonnes)	111



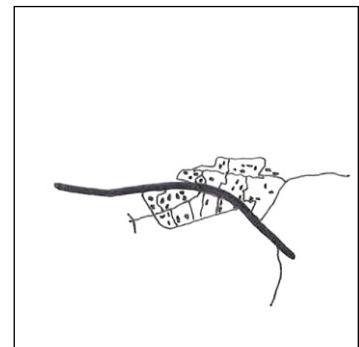
RUNWAY



TERMINAL



AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

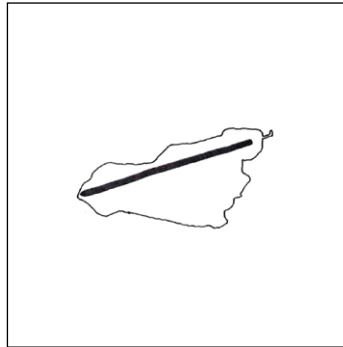
Kvernberget was the second airport to open in Møre og Romsdal, with flights commencing on 1 July 1970. A second helicopter terminal opened in 1994. The runway was extended for the original 1,830 meters (6,000 ft) to the current length in 2012. A new terminal is under construction, due for completion in 2017.



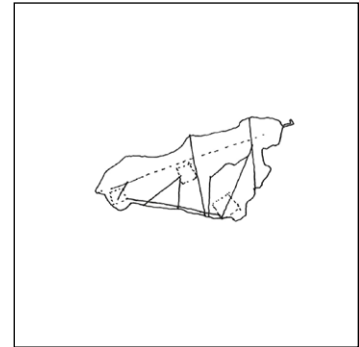
KKN

69°43'30"N 029°53'16"E

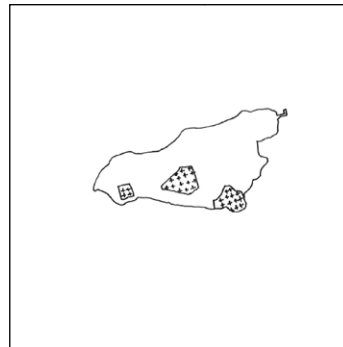
Airport type	Public
Operator	Avinor
Serves	Kirkenes, Norway
Location	Høybuktnoen, Sør-Varanger, Finnmark
Runways	2,115
Passengers	297,149
Aircraft movements	8,643
Cargo (tonnes)	367(2013)



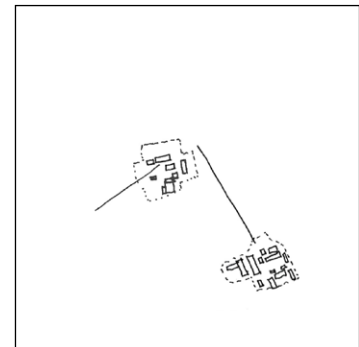
RUNWAY



CIRCULATION

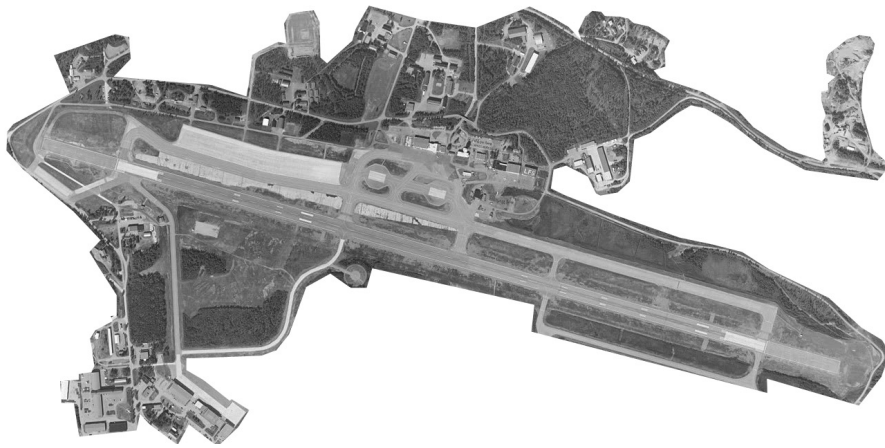


AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

Høybukta was built as a military air station by the Luftwaffe during World War II. Civilian services were introduced after the war, but abandoned in 1948. The airport reopened in 1963 with a new terminal and an extended runway. asphalt runway numbered 06-24. Scandinavian Airlines and Norwegian Air Shuttle operate Boeing 737-services to Oslo Airport, Gardermoen, in part generated by Høybukta's function as a hub for Widerøe's regional services to other airports in eastern Finnmark. During summer the airport experiences a very high traffic peak with both scheduled and charter aircraft arriving at the same time, as both intend to correspond with Hurtigruten; this causes patronage to rise beyond the airport's capacity.

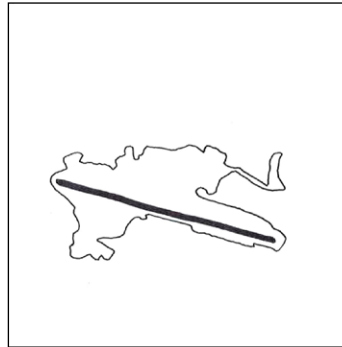


BDU

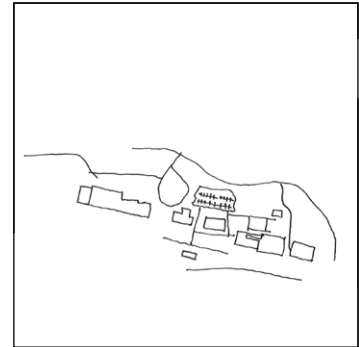
69°03'21"N 018°32'25"E

Airport type	Joint (public and military)
Operator	Avinor
Serves	Bardufoss, Målselv, Norway
Runways	2,443
Passengers	218,451
Aircraft movements	5,905
Cargo (tonnes)	62(2014)

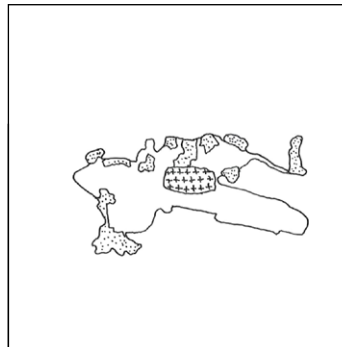
BDU



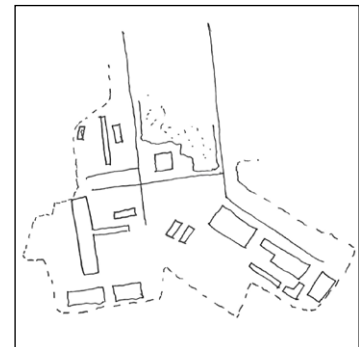
RUNWAY



TERMINAL



AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1



Bardufoss was selected an emergency landing airfield by the Norwegian Army Air Service in 1934, with construction starting in early 1935.

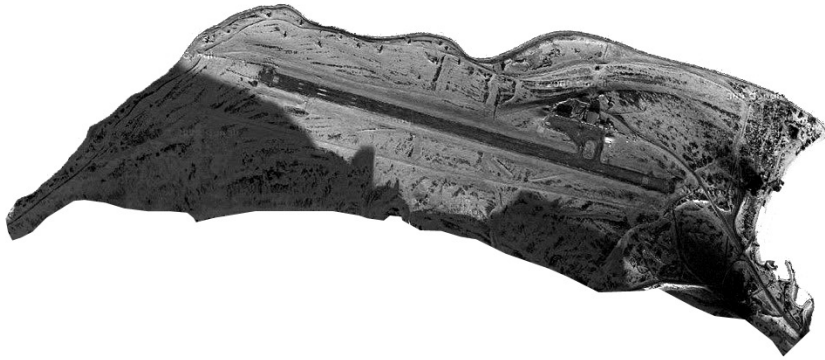
Three times a week SAS operated a night flight from Bardufoss and Bodø to Oslo, with Andøya Airport, Andenes added in 1964, using a Convair Metropolitan.

The terminal was extended in 1972 with a new arrivals hall.

A new cafeteria opened in the terminal in 1988.

A new control tower, costing NOK 55 million, was completed in September 1993.

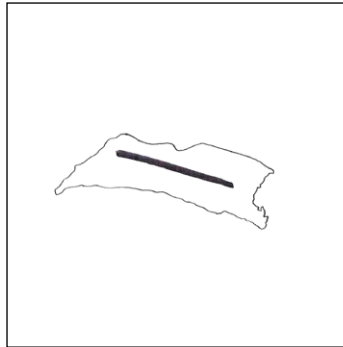
Plans for a new terminal commenced with the coordination of civilian and military flights, which had initially resulted in the old civilian terminal being closed.



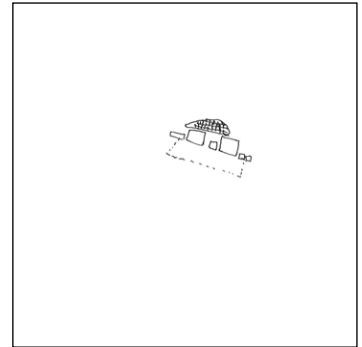
LYR

78°14'46"N 015°27'56"E

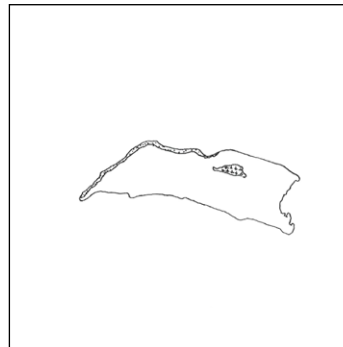
Airport type	Public
Owner/Operator	Avinor
Serves	Longyearbyen, Svalbard, Norway
Location	Hotellneset, Longyearbyen, Svalbard, Norway
Runways	2,483
Passengers	154,261
Air movements	6,943
Cargo (tonnes)	608(2014)



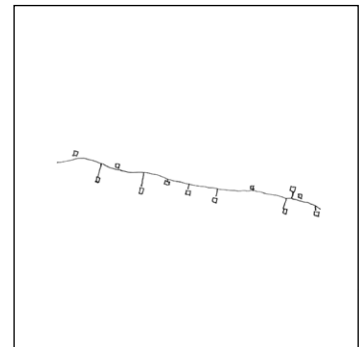
RUNWAY



TERMINAL

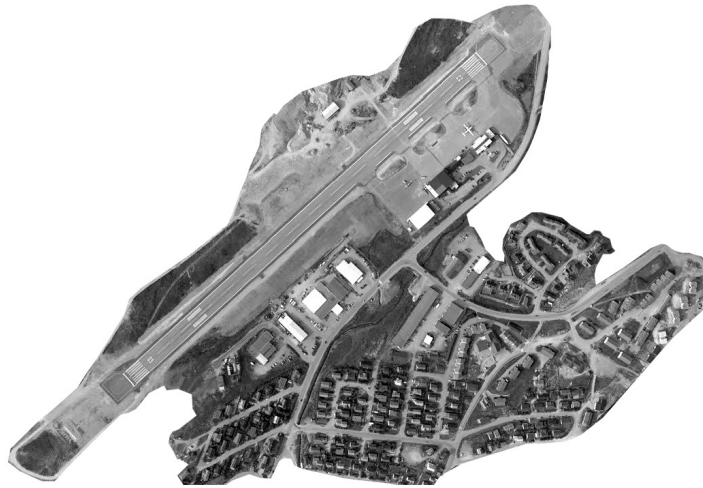


AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

In 2014, the airport handled 154,261 passengers. Scandinavian Airlines operates daily flights to Tromsø and Oslo in mainland Norway. Lufttransport provides services to the two other airports on Svalbard: Ny-Ålesund and Svea, using Dornier Do 228 turboprop aircraft. There are also regular charter flights.

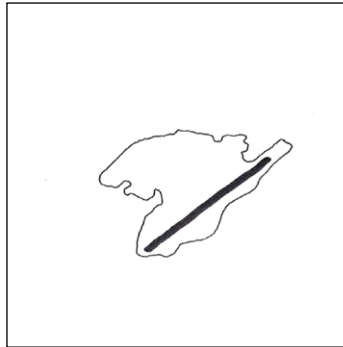


HFT

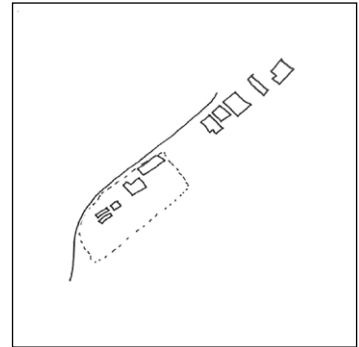
70°40'47"N 023°40'07"E

Airport type	Public
Operator	Avinor
Serves	Hammerfest
Location	Prærien, Hammerfest, Norway
Runways	880
Passengers	145,396
Aircraft movements	13,822
Cargo (tonnes)	16(2014)

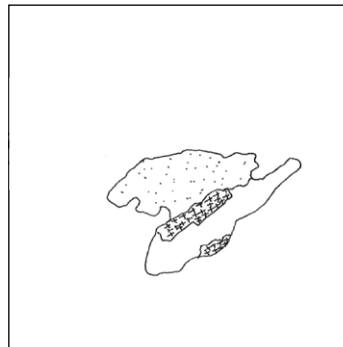
HFT



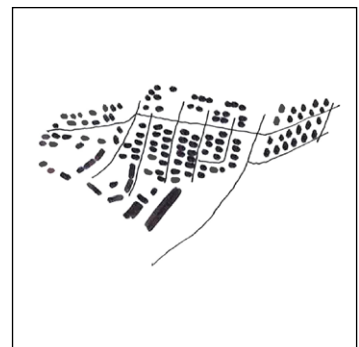
RUNWAY



TERMINAL



AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

Avinor is considering building a new airport at Grøtnes, which would be built as re-claimed land 15 kilometers (9 mi) from Hammerfest. The terminal would be located on a peninsula while the runway would be built on a filling in the fjord. Avinor has studied two possible runway lengths, 1,199 meters (3,934 ft) and 1,550 meters (5,090 ft).

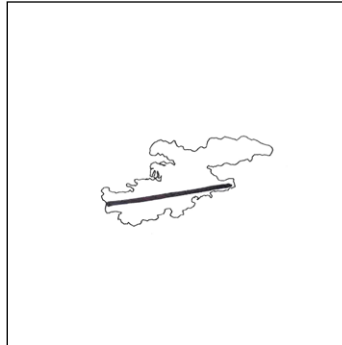


FRO

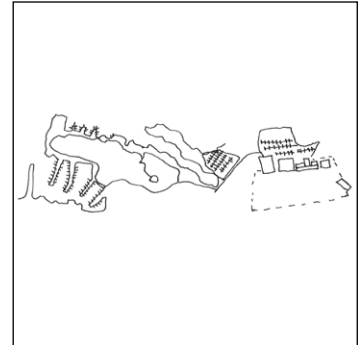
61°35'01"N 005°01'29"E

Airport type	Public
Operator	Avinor
Serves	Floro, Norway
Location	Florelandet, Florøy
Runways	1,264
Passengers	200,356
Aircraft movements	11,654
Cargo (tonnes)	3(2014)

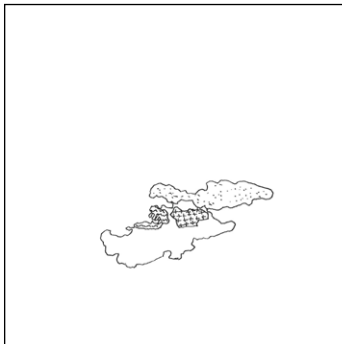
FRO



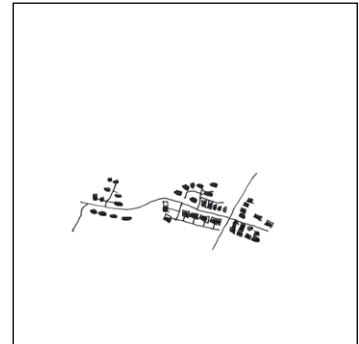
RUNWAY



TERMINAL-HABOUR



AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

Construction of an airport first commenced in 1956, but was terminated. Florø Airport opened as part of a network of four regional airports on 1 July 1971. Widerøe served it with de Havilland Canada Twin Otters, later also de Havilland Canada Dash 7s. The heliport opened in 1994 and the runway was extended from the original 830 meters (2,720 ft) in 2000. That year Coast Air took over the routes from Widerøe. Danish Air Transport resumed them in 2003 until Widerøe again won back the operations in 2012. The search and rescue base opened in 2009. There are proposals to extend the runway further.

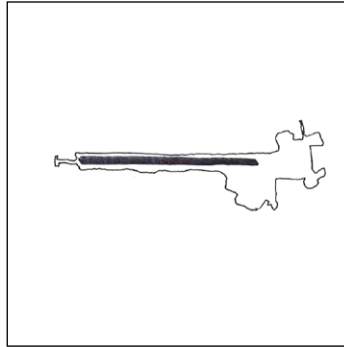


SKN

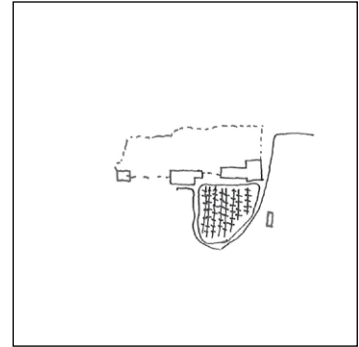
68°34'51"N 15°01'34"E

Airport type	Public
Operator	Avinor
Serves	Stokmarknes and Sortland
Location	Skagen
Runways	919
Passengers	95,978
Aircraft movements	6,120
Cargo (tonnes)	6(2014)

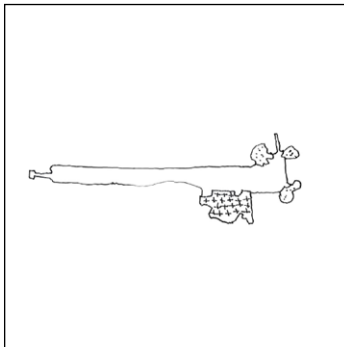
SKN



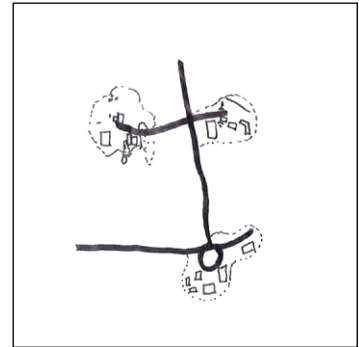
RUNWAY



TERMINAL

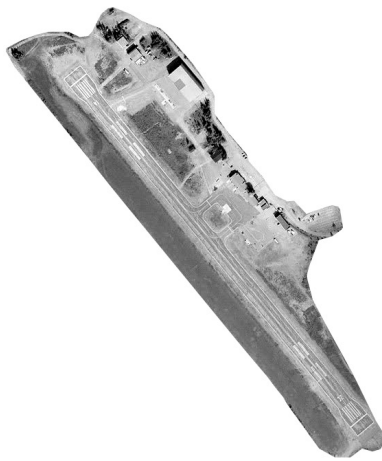


AIRPORT CITY PATTERN



AIRPORT CITY STRUCTURE 1

The airport opened 1 July 1972 as part of a government program of building a series of small airports along the coast. This was a major success and an important step for the population in the area (Vesterålen archipelago), who now could travel to the bigger cities of Norway and the rest of the world in one day, not weeks. Currently owned and operated by Avinor, the airport was managed by the Hadsel municipality for the first 20 years.

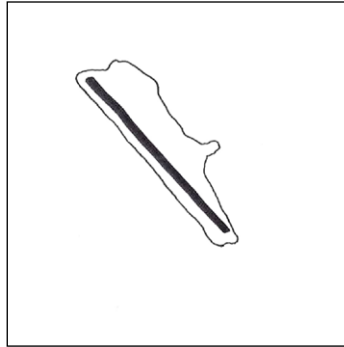


MON

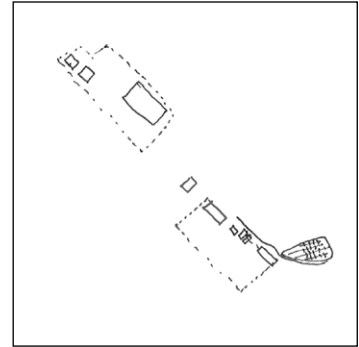
66°21'50"N 014°18'06"E

Airport type	Public
Operator	Avinor
Serves	Mo i Rana
Location	Rossvoll, Rana, Norway
Runways	871
Passengers	104,474
Aircraft movements	7,374
Cargo (tonnes)	13(2014)

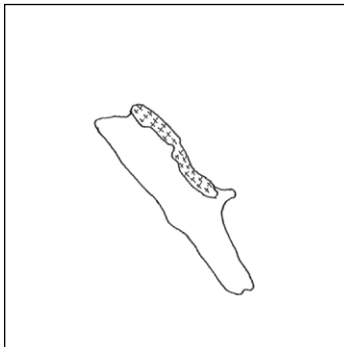
MON



RUNWAY

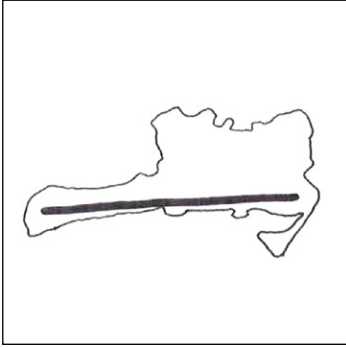


TERMINAL

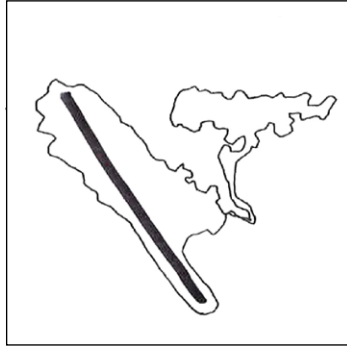


AIRPORT CITY PATTERN

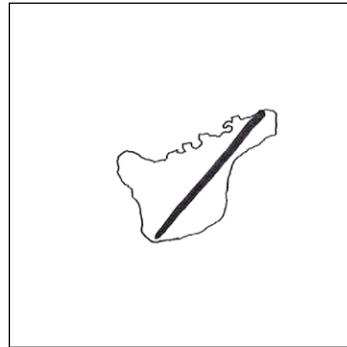
The airport is located in Røssvoll about 20 minutes north-east of the town along the E6. There are no buses to the airport, but taxis are available. Rental cars are available in the town of Mo i Rana. In June 2013 the parliament decided to build the new airport a few km south of Røssvoll airport.



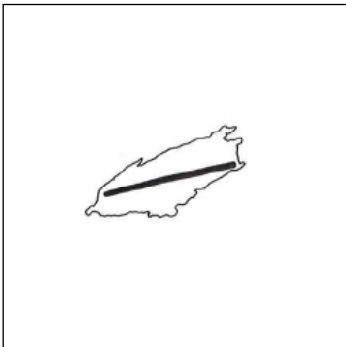
EVE



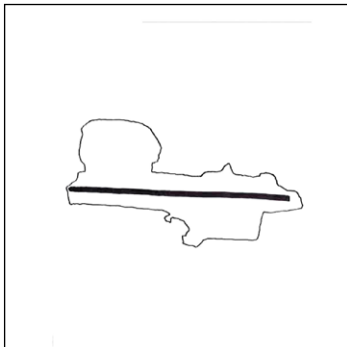
HAU



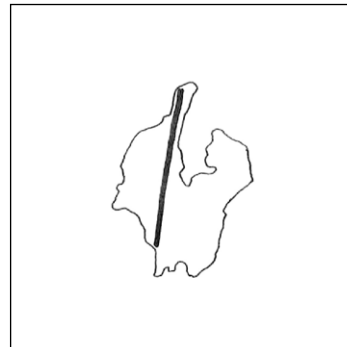
KRS



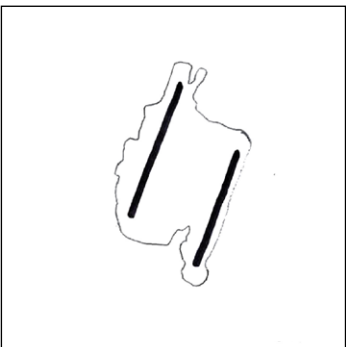
BOO



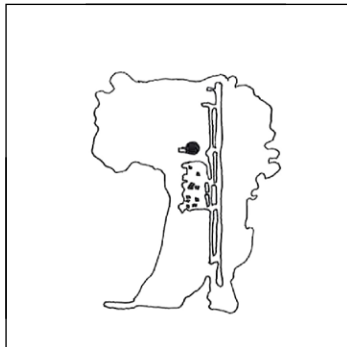
TRF



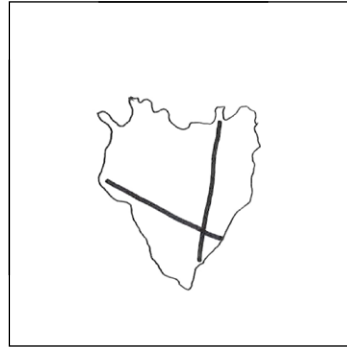
TOS



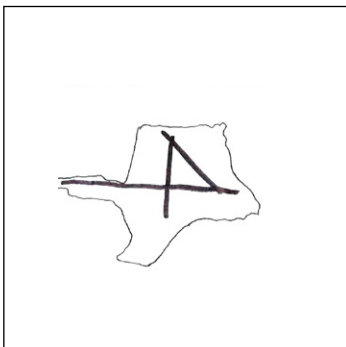
OSLO



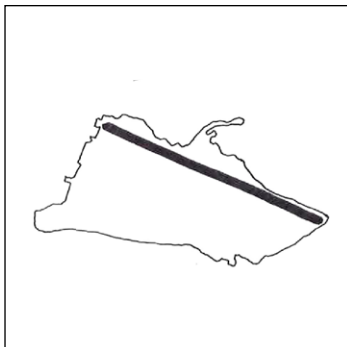
BGO



SVG

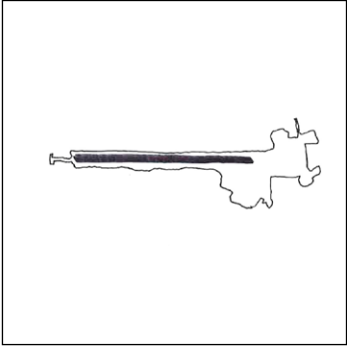


TRD

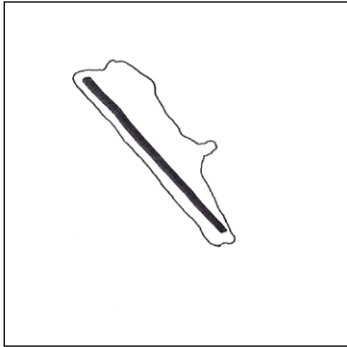


ALF

run- way



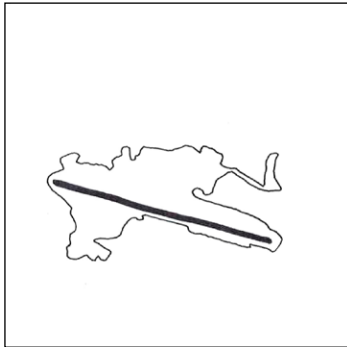
SKN



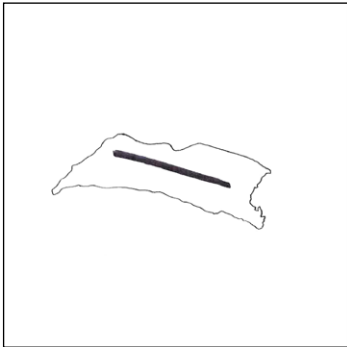
MON



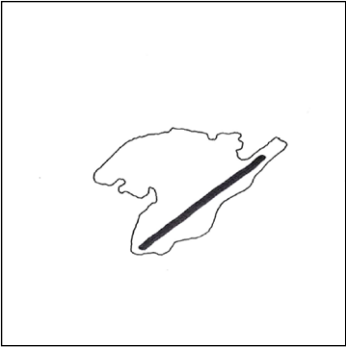
FRO



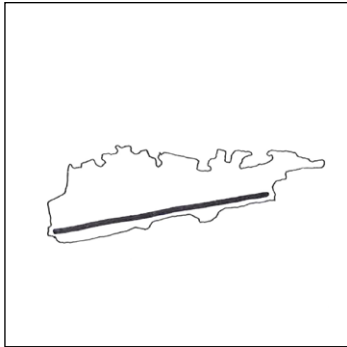
BDU



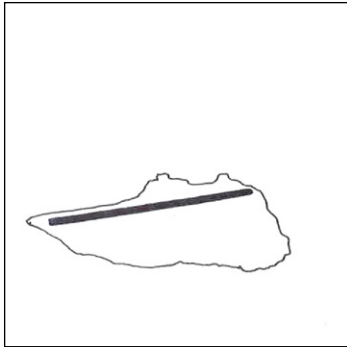
LYR



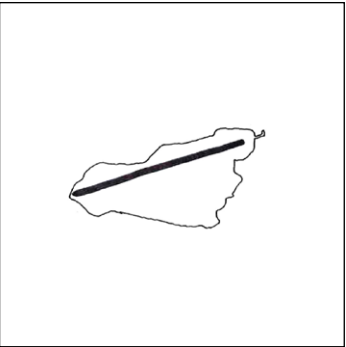
HFT



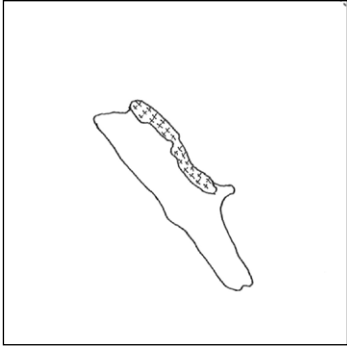
MOL



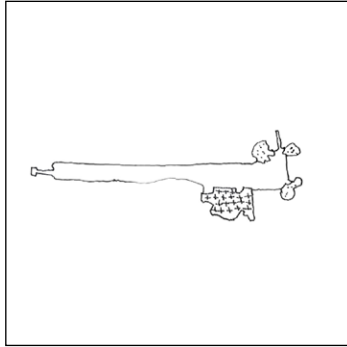
KSU



KKN



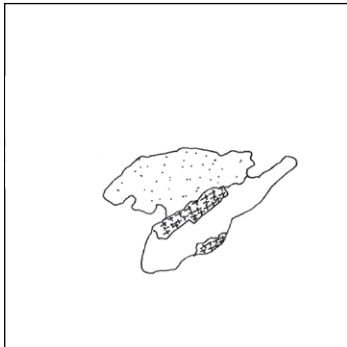
MON



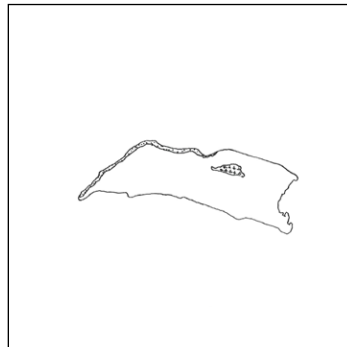
SKN



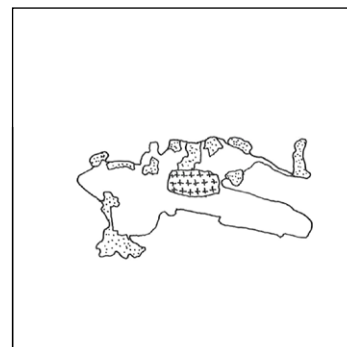
FRO



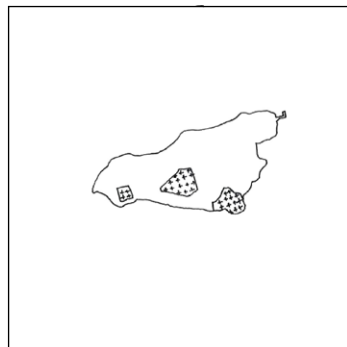
HFT



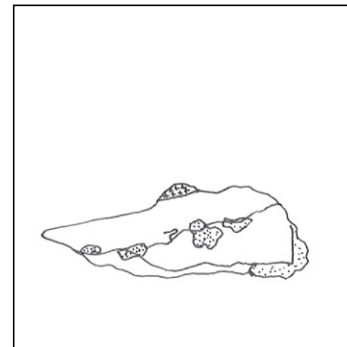
LYR



BDU



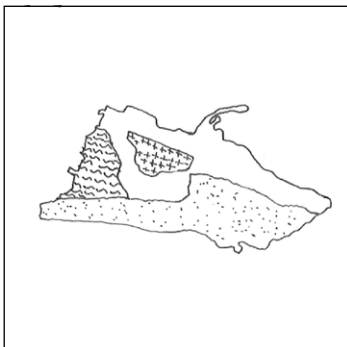
KKN



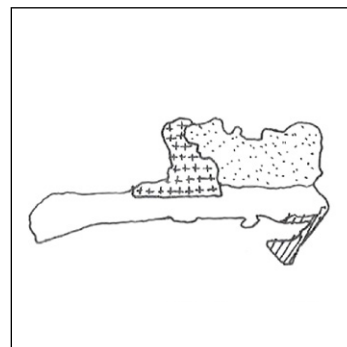
KSU



MOL



ALF

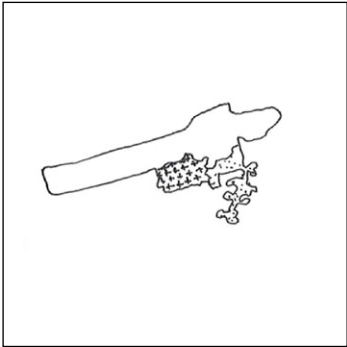


EVE

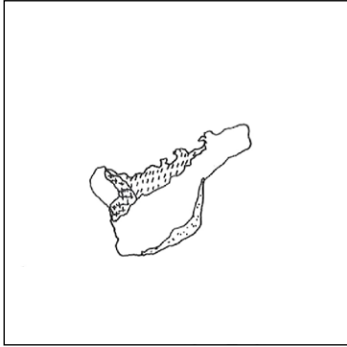
configuration



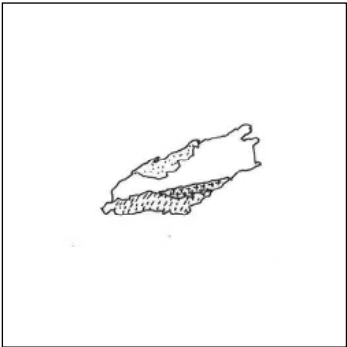
HAU



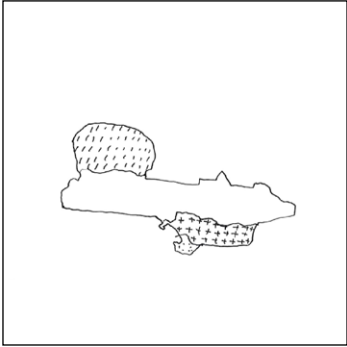
AES



KRS



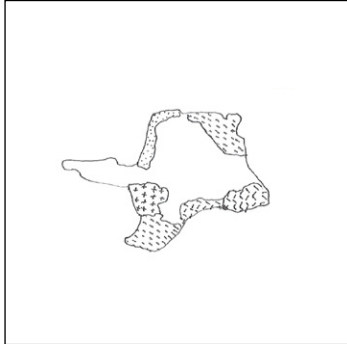
BOO



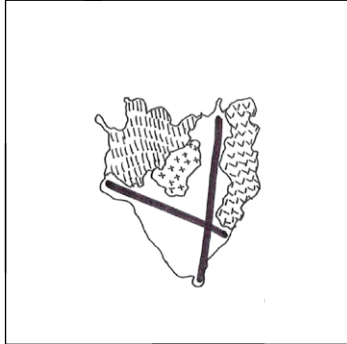
TRF



TOS



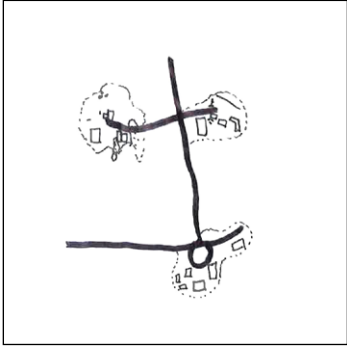
TRD



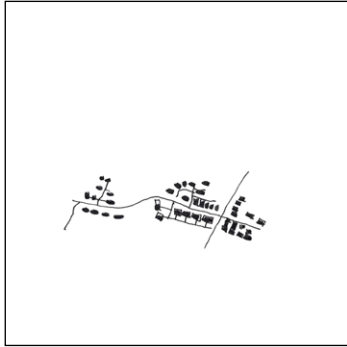
SVG



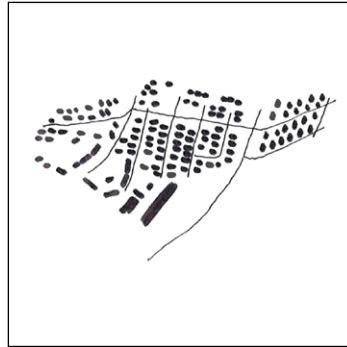
BGO



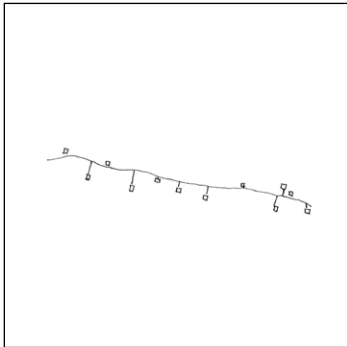
SKN



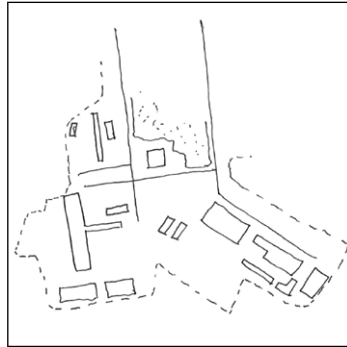
FRO



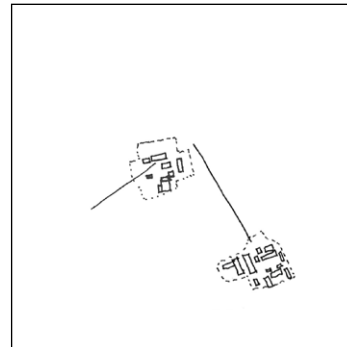
HFT



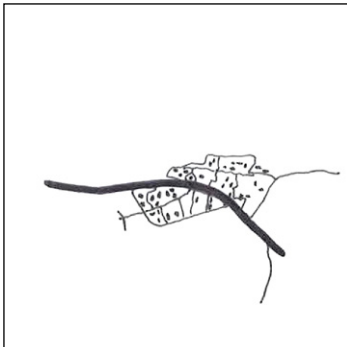
LYR



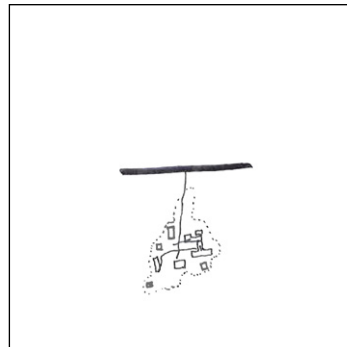
BDU



KKN



KSU



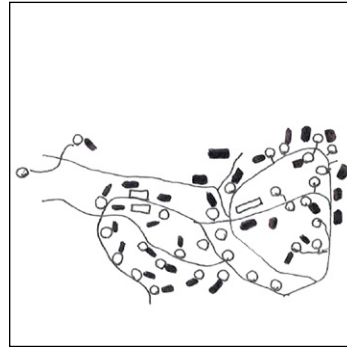
MOL



ALF

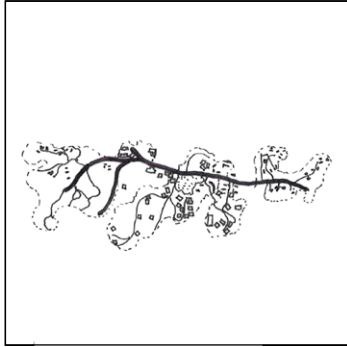


OSL

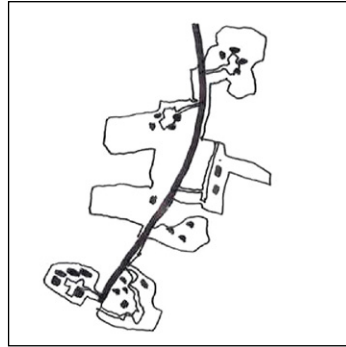


EVE

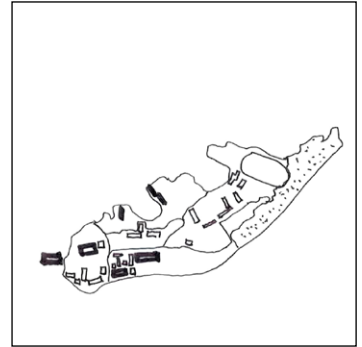
airport cities



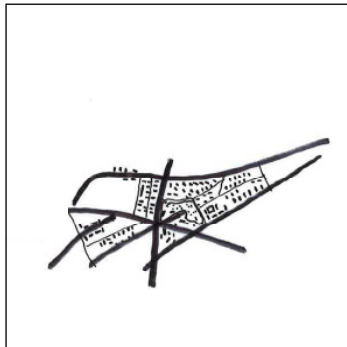
HAU



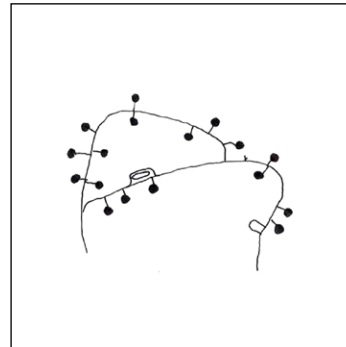
AES



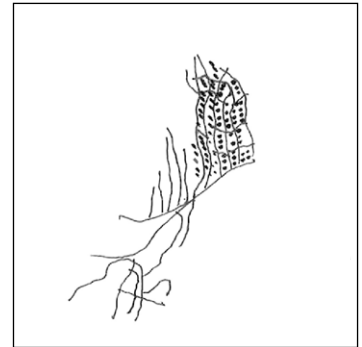
KRS



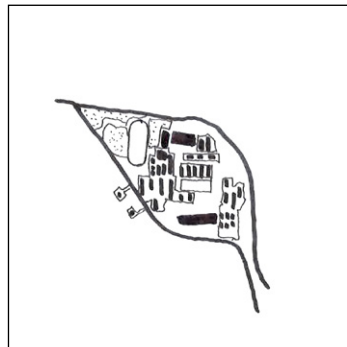
BOO



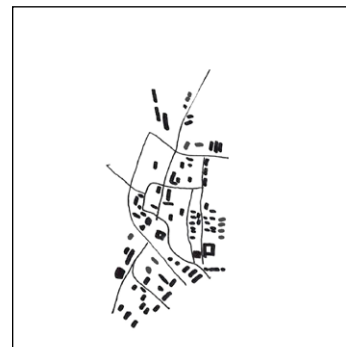
TRF



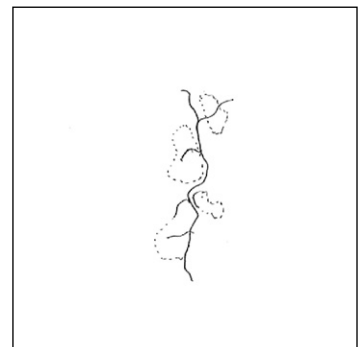
TOS



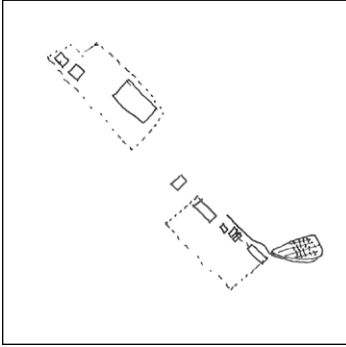
TRD



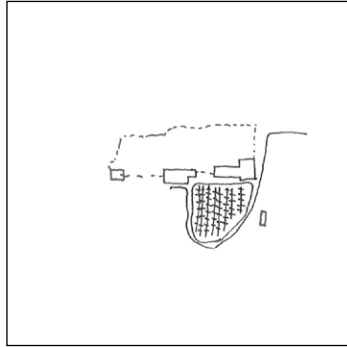
SVG



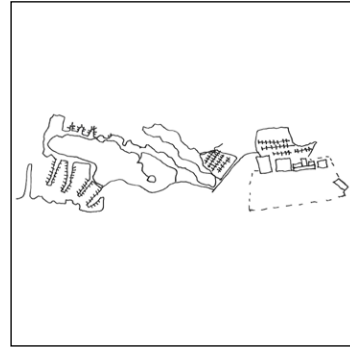
BGO



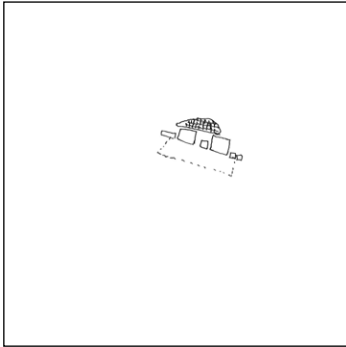
MON



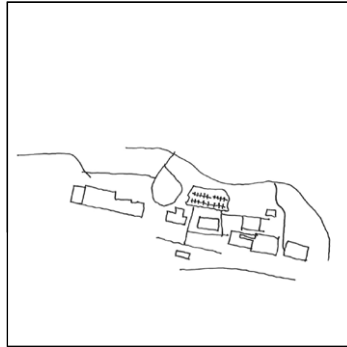
SKN



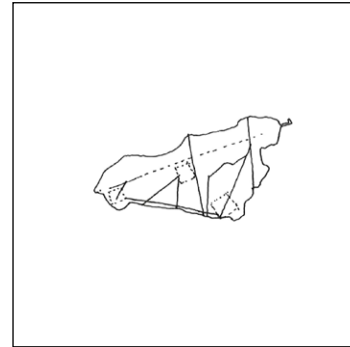
FRO



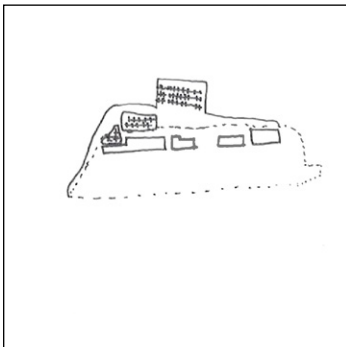
LYR



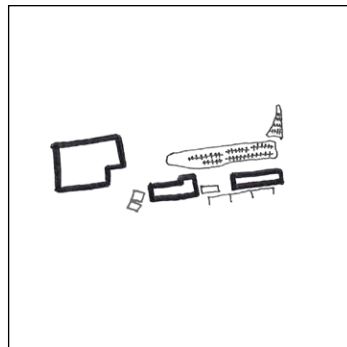
BDU



KKN



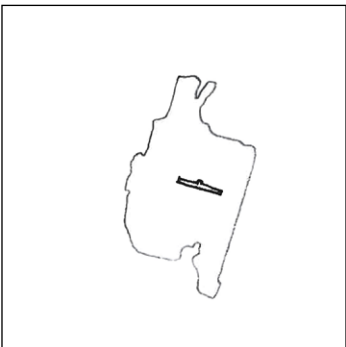
KSU



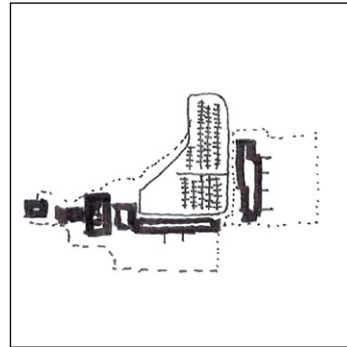
MOL



ALF/ TERMINAL-HABOUR

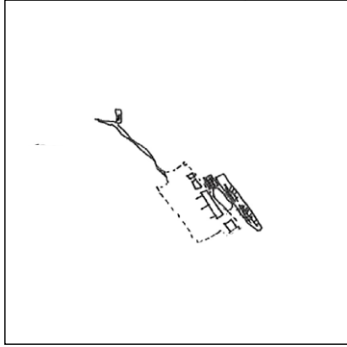


OSL

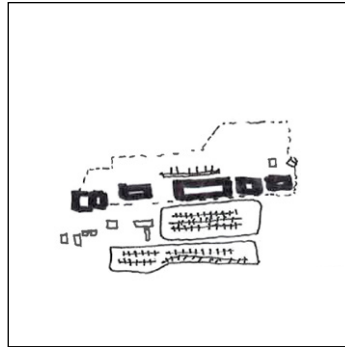


EVE

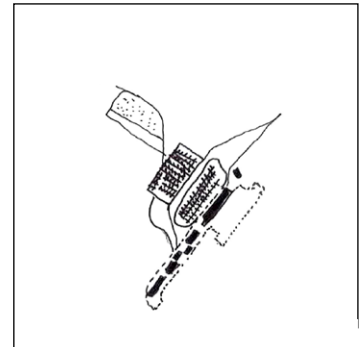
termi- nals



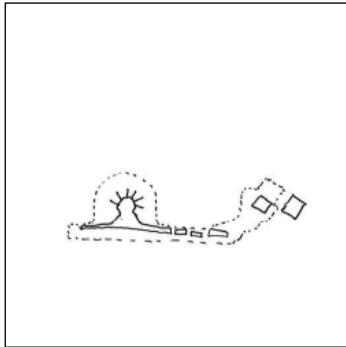
HAU



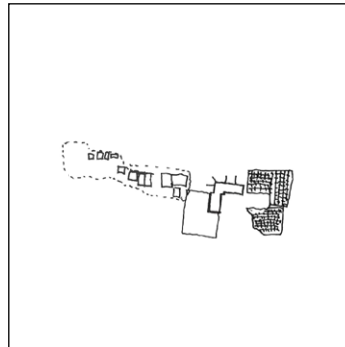
AES



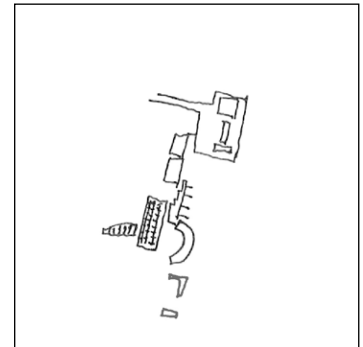
KRS



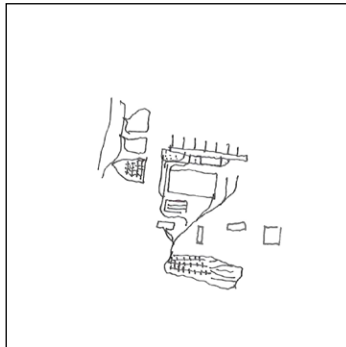
BOO



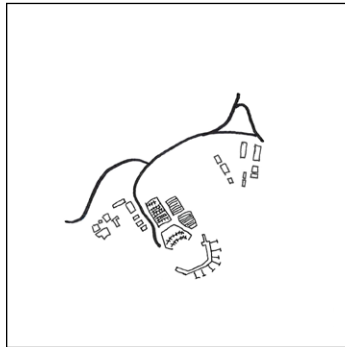
TRF



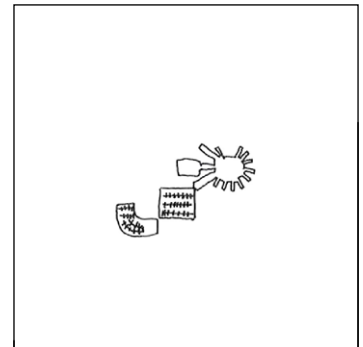
TOS



TRD



SVG



BGO

