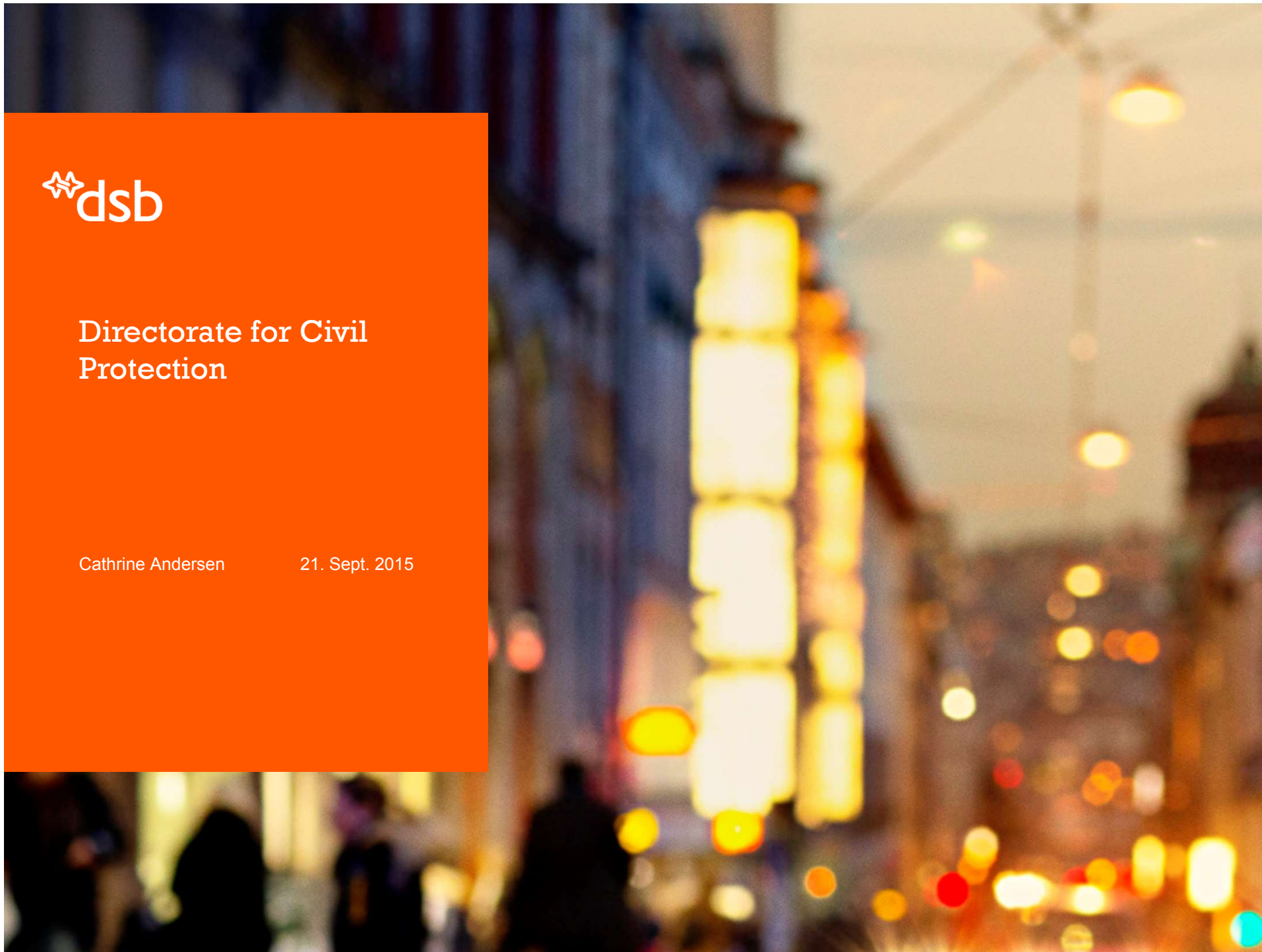


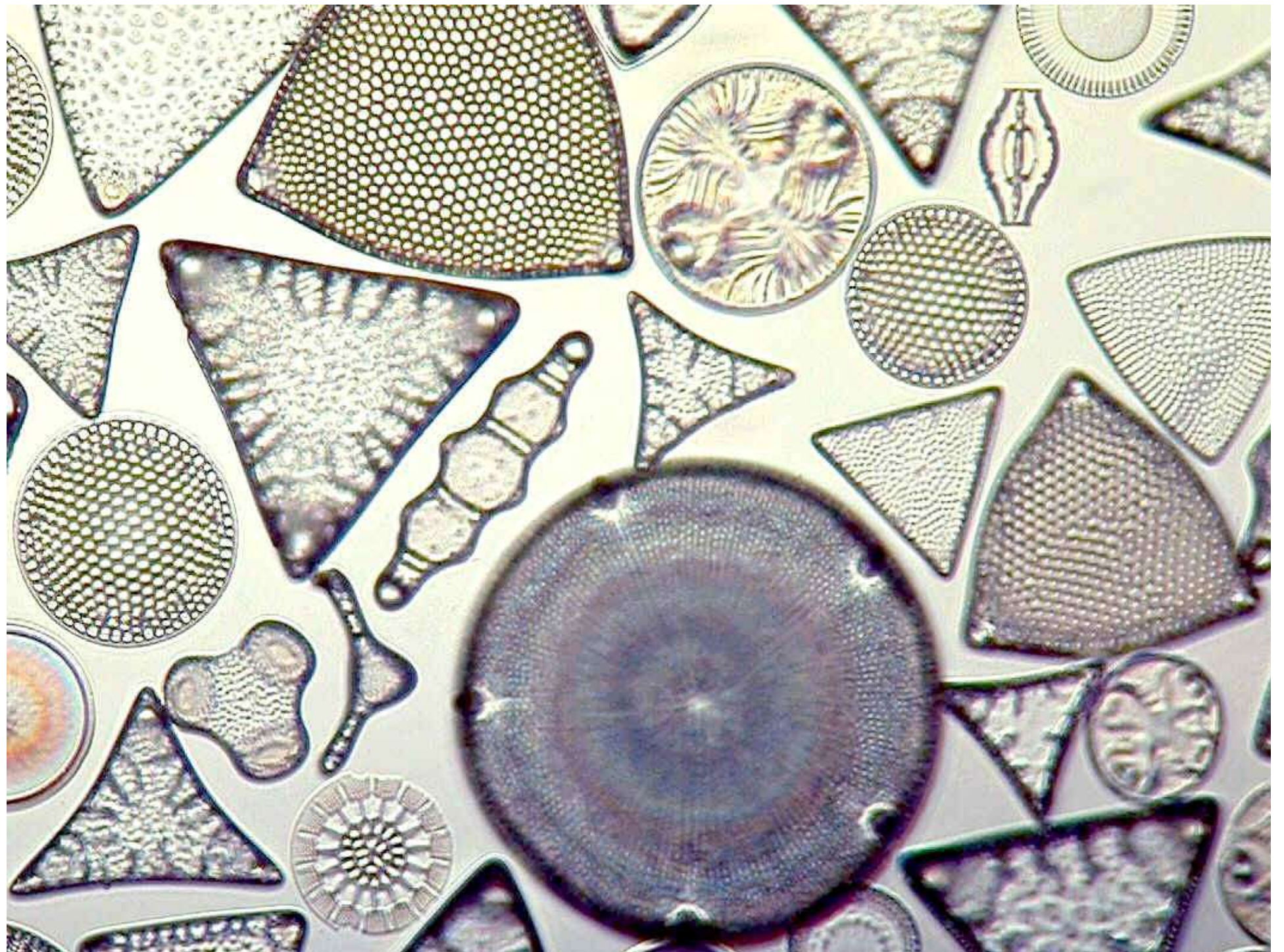


Directorate for Civil
Protection

Cathrine Andersen

21. Sept. 2015







Klima i Norge 2100

Bakgrunnsmateriale til NOU Klimatilpassing



Klima i Norge 2100

Kunnskapsgrunnlag for klimatilpassing oppdatert i 2015

NCCS report no. 2/2015



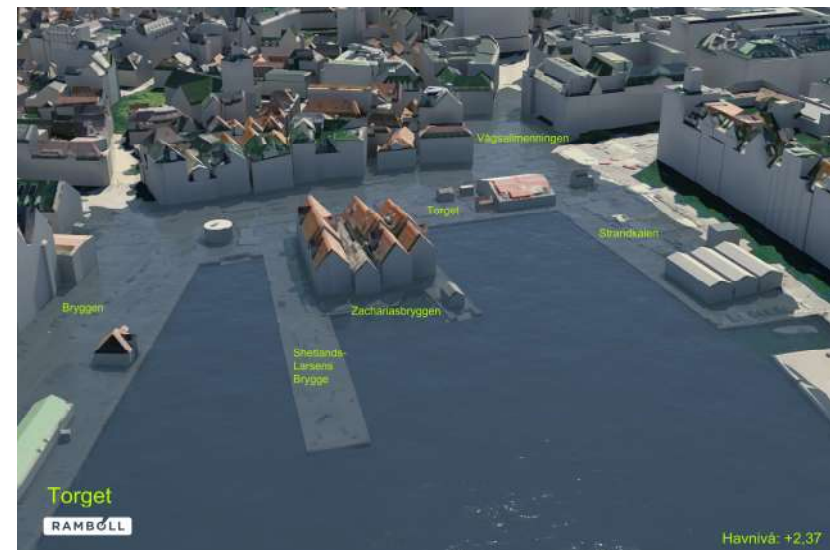
Foto: Anne Olsen-Ryum, www.hasvikfoto.no

Redaktører

I. Hanssen-Bauer, E.J. Førland, I. Haddeland, H. Hisdal, S. Mayer, A. Nesje, J.E.Ø. Nilsen, S. Sandven, A.B. Sandø, A. Sorteberg og B. Ådlandsvik



Consequences



Milder and drier
winters



(combined with
heavy wind)

Challenges







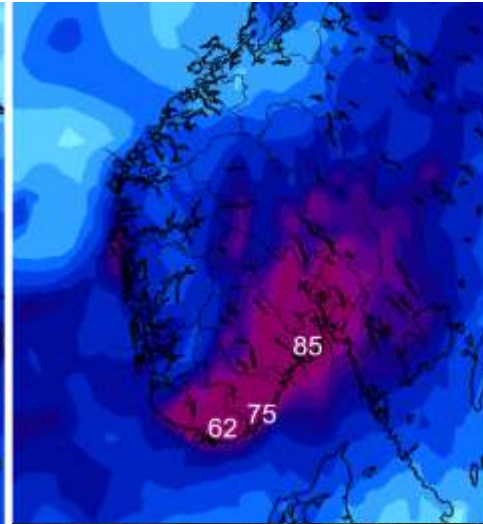
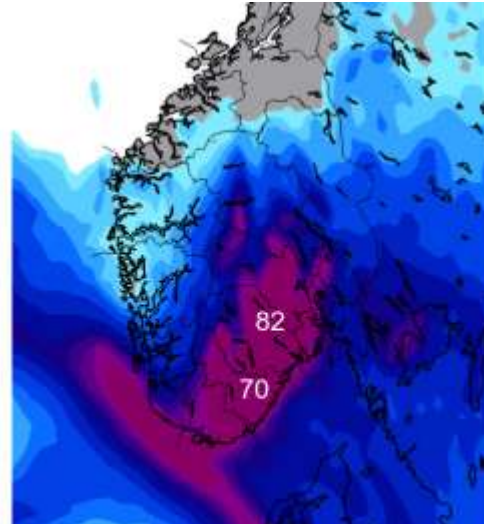
Bad weather or bad planning?



Bad weather or bad planning?

Monday kl.12 – Tuesday kl.12

Thursday kl.00 – Friday kl.00



Cities of the future

FRAMTIDENS BYAR



Cities of the future

Risks and vulnerability analysis

water

urban flooding

sea level rise

CCA integrated in policy documents

CCA integrated in planning

Good adaptation examples

BGF – blue and green factors

«The cities are growing, and along the way we seem to have forgotten, that the water from above, comes with a one-way-ticket.»

Anita Verpe Dyrrdal (Norwegian meteorologist)



Measures in different sizes:

S



< 20 mm
infiltration

M

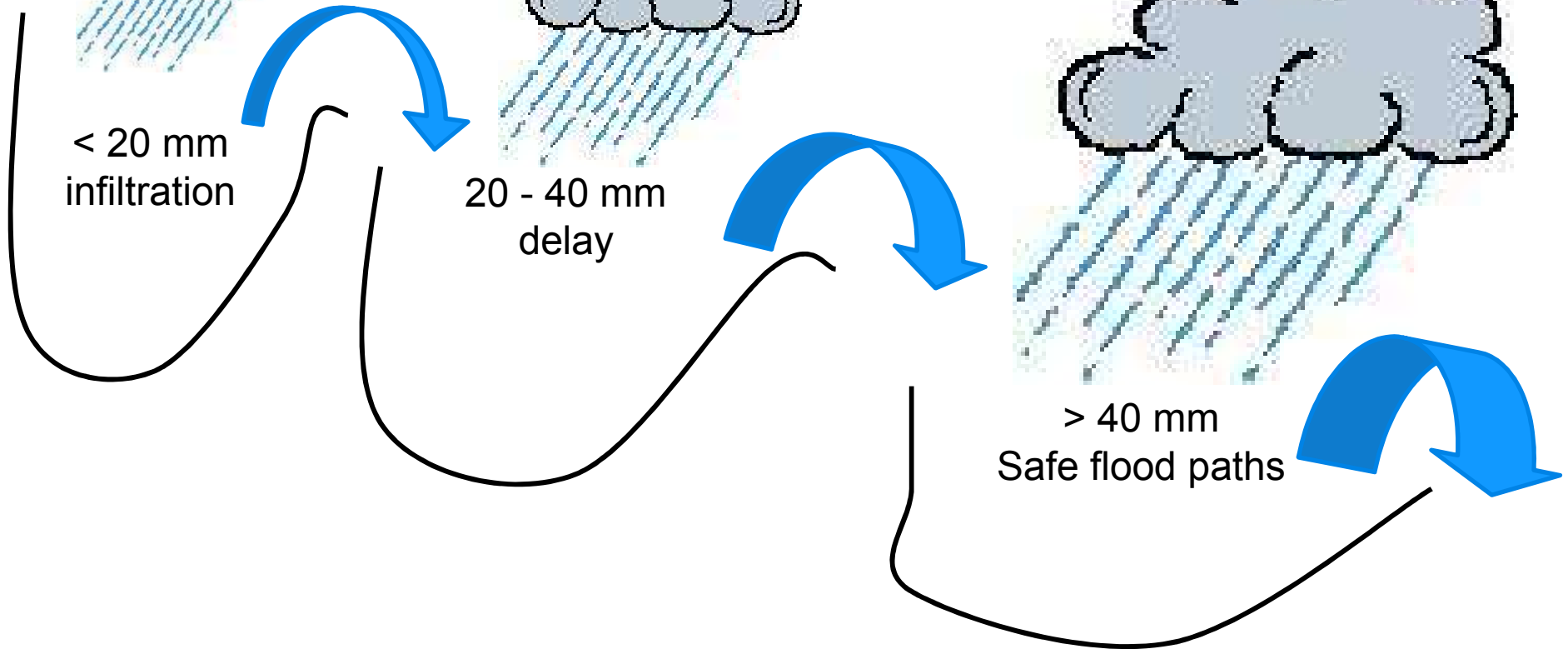


20 - 40 mm
delay

L



> 40 mm
Safe flood paths



Small



Small



Photo: David V. Brasfield, Oslo kommune

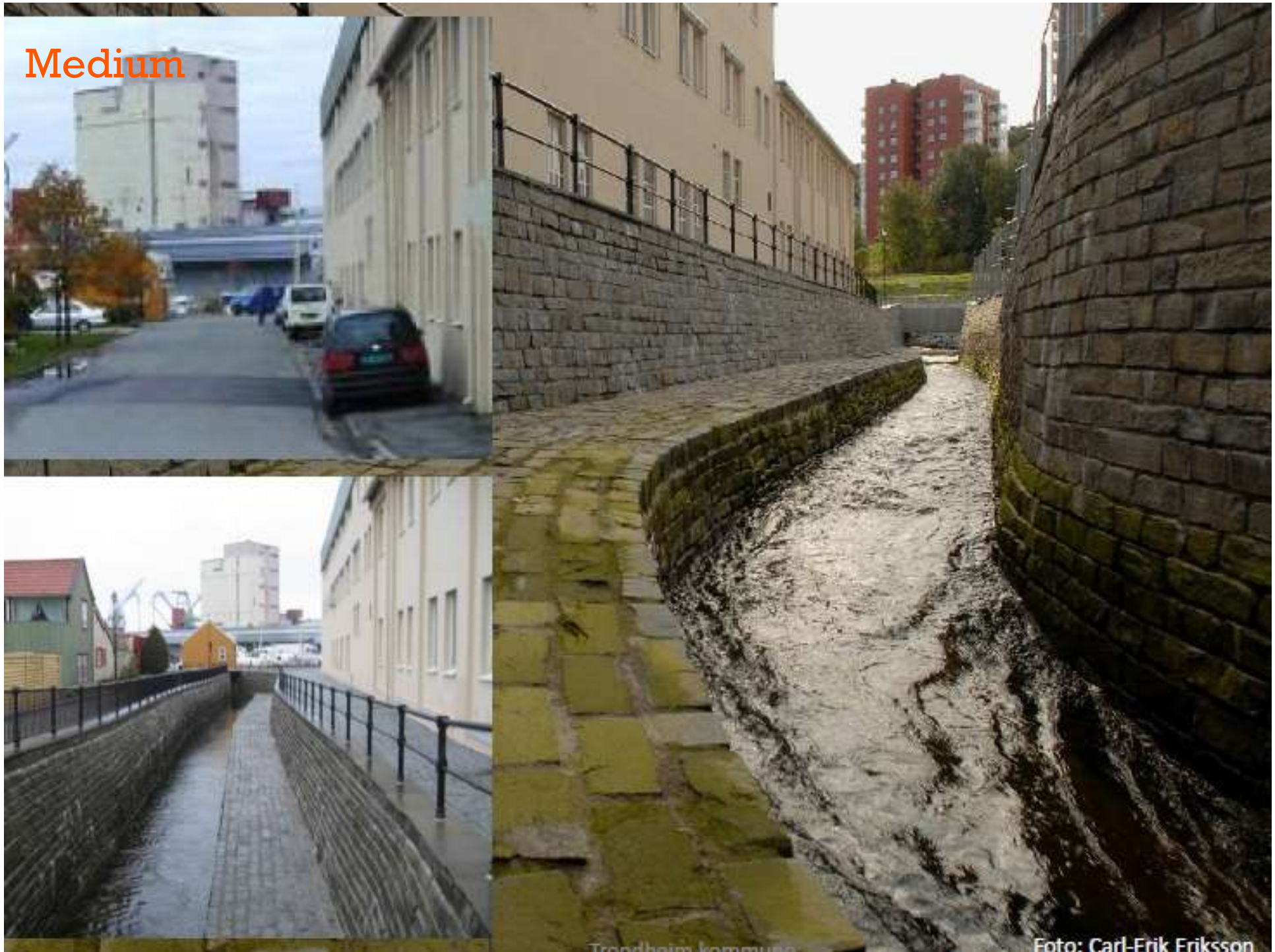


Medium



Photo: David V. Brasfield, Oslo kommune

Medium





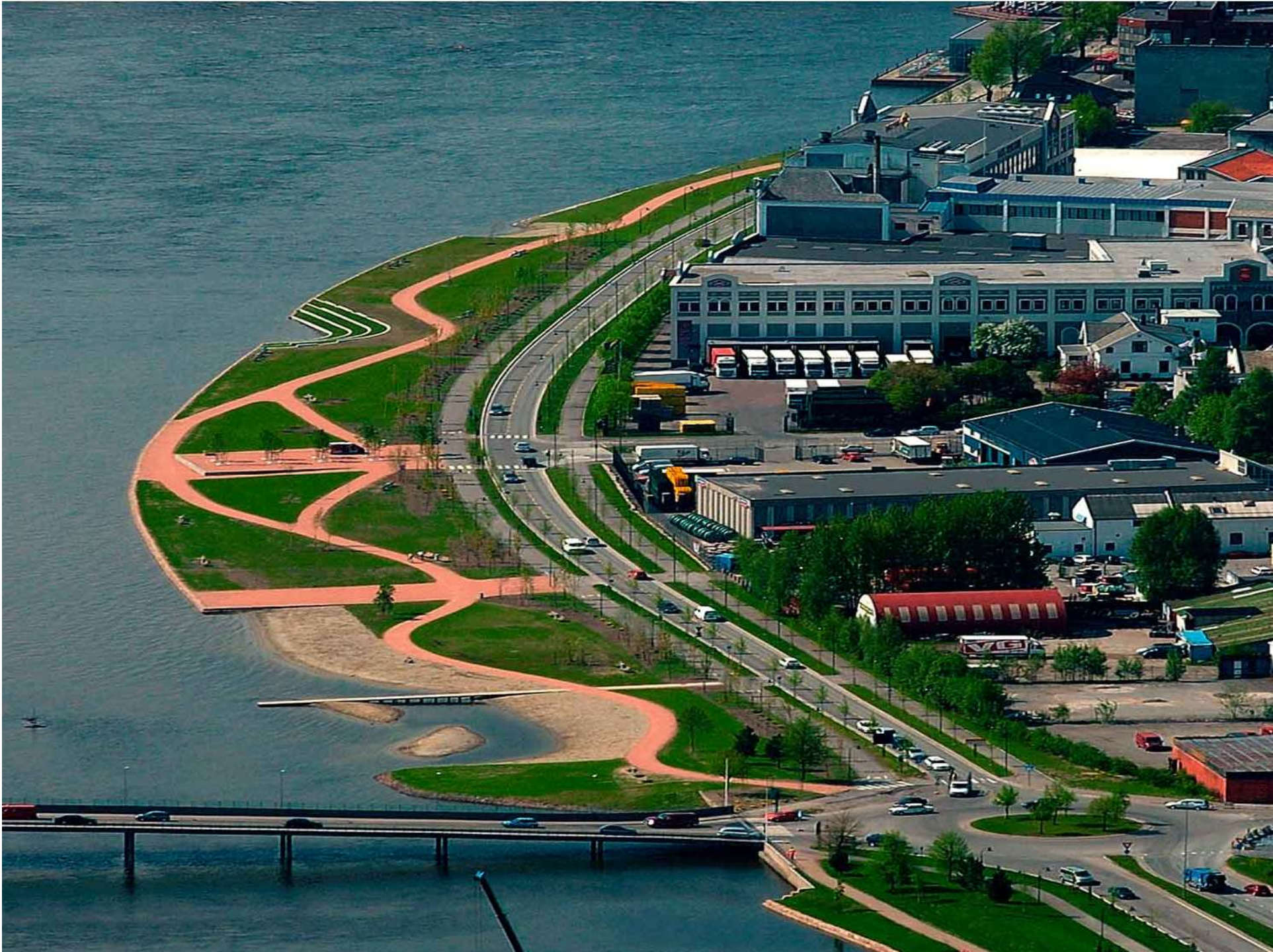
Larve

Skiens viktigste flomvei er Torggata midt i sentrum



Boliggater kan være greie flomveier. Den viktigste flomveien i Ski er Kvernålgata og Torggata som går gjennom sentrum, forteller virksomhetsleder for vannforsyning og avløp i Ski, Gunnar Mosevoll. Foto: Ole Bjørn Ulsnes

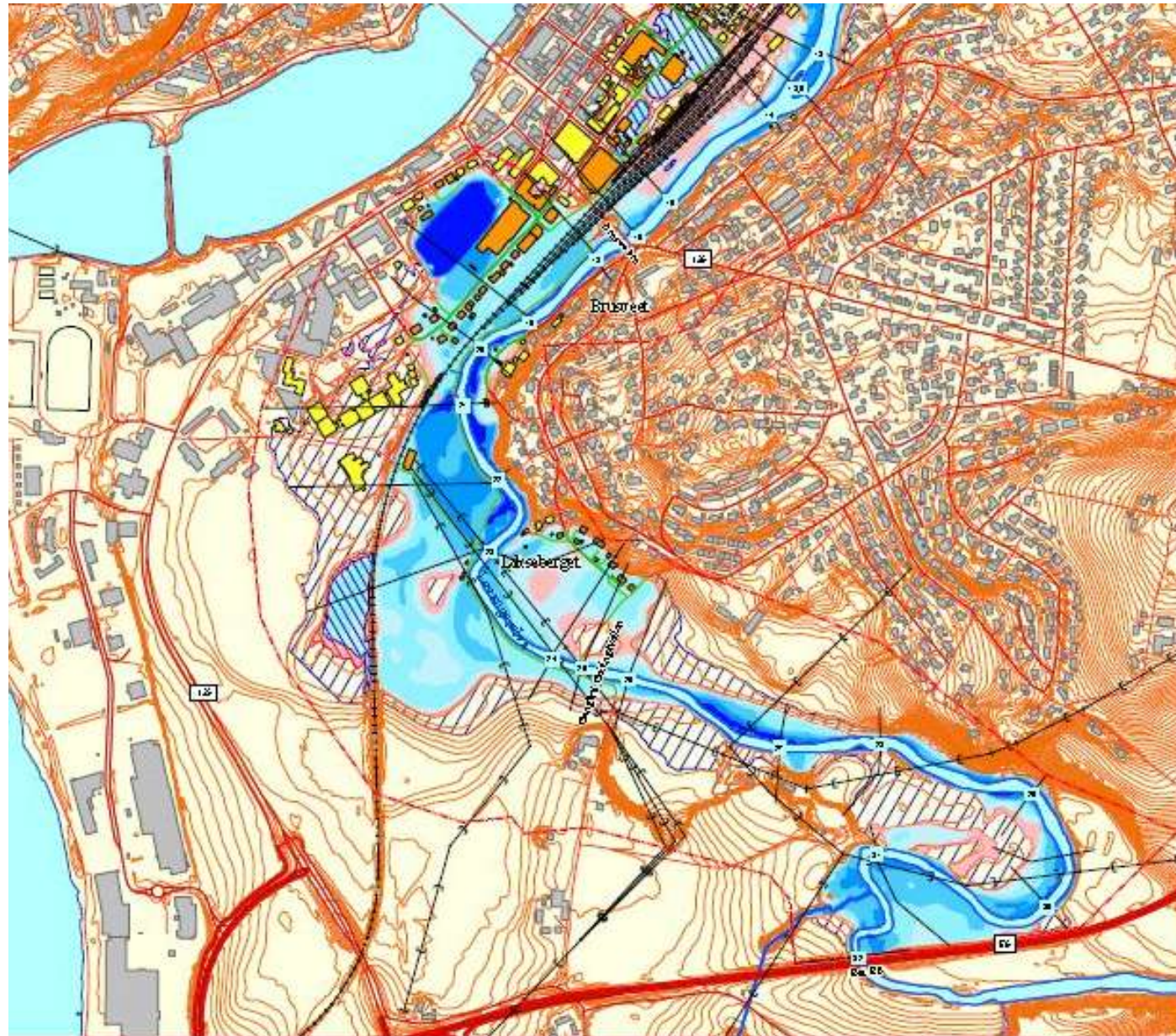


















Success factors



-  200-årsflom (200-year flood)
-  100-årsflom (100-year flood)
-  50-årsflom (50-year flood)
-  Kretslinje
-  Bekk
-  Europ-, riks- og fylkesvei med utnummer
-  Kommune- og privatei
-  Jernbane
-  Høydekurver med enmeters skilletekke



FLOMSONEKART

Prosjekt: Levanger
 Kartblad Levanger
 200-årsflom
 Godkjent 26. februar 2013

Målestokk 1:6 500



Koordinatystem:	UTM 32
Kartgrunnlag:	
Situasjon:	Kartverket, FK8 2012
Høydedata:	Kartverket, base data 2012
Flomsoneanalyse:	
Flomsonekart:	NVE Rapport 20/2012
Vannlinjer:	Notat 25.D1 2013
Terrengmodell:	okt 2012
GIS-analyse:	feb. 2012
Prosjekt rapport:	10/2013
Prosjekt nummer:	125_1

NORGES VASSDRAGS- OG ENERGI-DIREKTORAT (NVE)

Pb. 5091 Majorstua, 0301 Oslo
 Tlf. 02975 Faks: 22 95 90 00
 Internett: <http://www.nve.no/flomsonekart>

Success factors



Photo: DSB

NEED:
ELECTRI-
CITY

NEED:
MORE
WINE

NEED:
CUTE
FIREMAN