

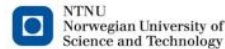
Campus alive

Transformation and integration of university work and campus space

CFM – DTU 29.08.2016

Tore Haugen,
Professor, NTNU

Tone Merethe Aasen,
Senior Research Scientist, SINTEF



NTNU2060
VISIONS FOR CAMPUS DEVELOPMENT

JANUARY 2014



University campus of the future

- Our main research question :

- *How can strategic campus development contribute to sustain and develop universities as attractive places for learning and knowledge development in a future of increased competition in higher education and research?*

Our discussion is motivated by challenges created by new circumstances, like the need for more flexibility, a new digital reality for education, and increased internationalization of higher education.





NTNU 01.01.2016 –
merged with 3 university colleges:

- Høgskolen i Sør-Trøndelag
- Høgskolen i Ålesund
- Høgskolen i Gjøvik

Trondheim
190.000 inhabitants



NTNU 2016:
39.000 students
(33.000 Trondheim)
6.700 employees
734.000 m²



Dragvoll



Gløshaugen

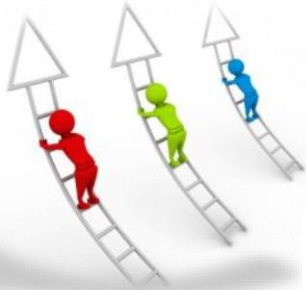


Øya

NTNU main campuses – before 01.01.2016

Four Senarios for Campus Development

Elite



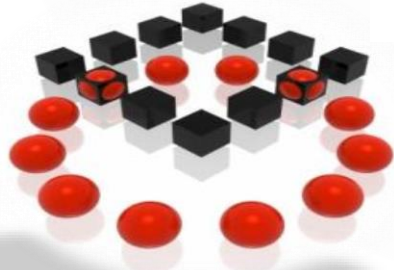
Growth



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Digital



Urban

Experimental learning



Across disciplines



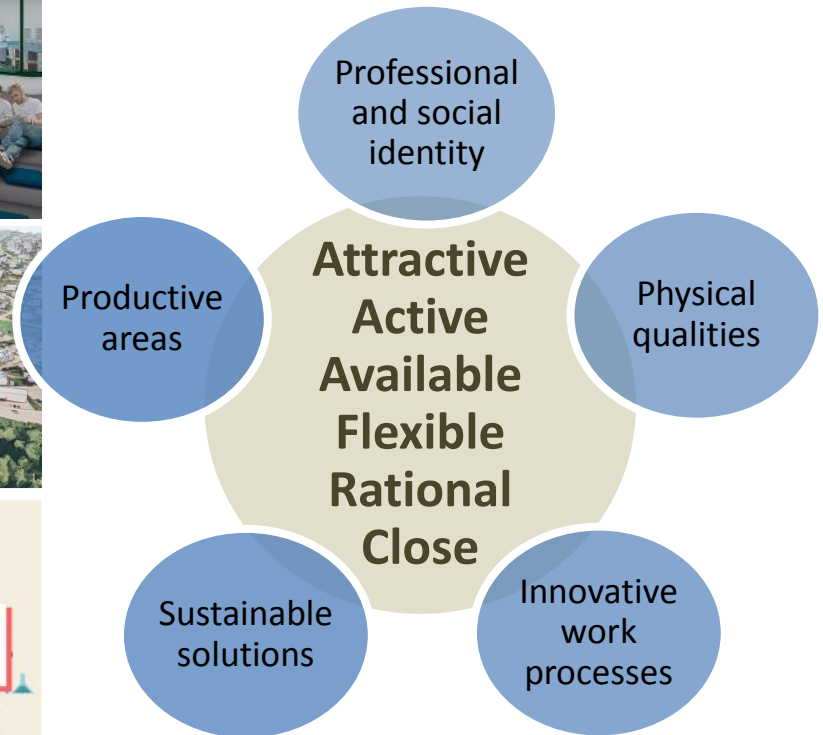
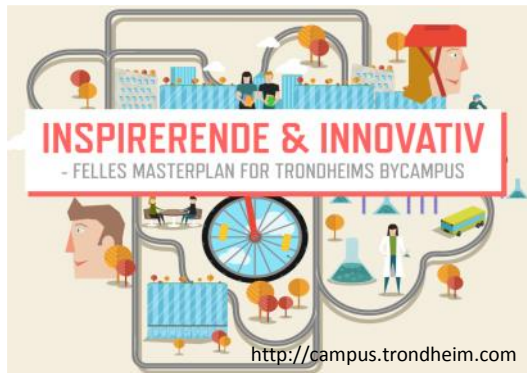
Cooperating with businesses and society



Aiming at sustainability



NTNU campus tomorrow and in 2060



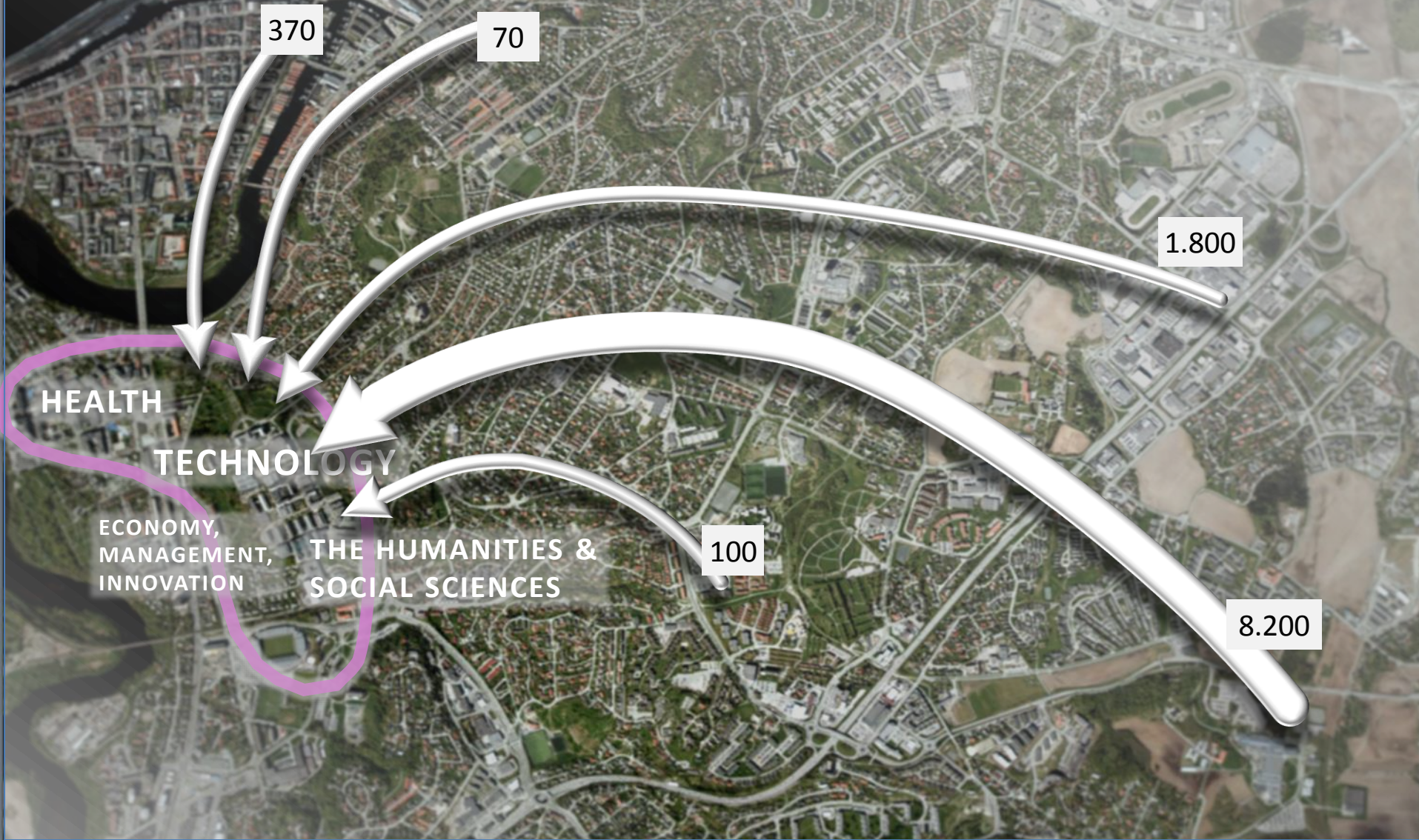
Work, learn, experience, and live 24/7



Illustrasjon: Bergersen arkitekter og SiT

Merging campuses –

Availability, attractiveness, effectiveness, flexibility



08.09.15: Government support to
NTNU campus development.
Prime minister Erna Solberg



1996

2000

2002

2006

...

2012

2013

KVU FRAMTIDIG
LOKALISERING AV
CAMPUS NTNU
KONSEPTVALGUTREDNING



RAMBOLL

NTNU
NTNU2060
VISJONER FOR CAMPUSUTVIKLING



January 2014

June 2014



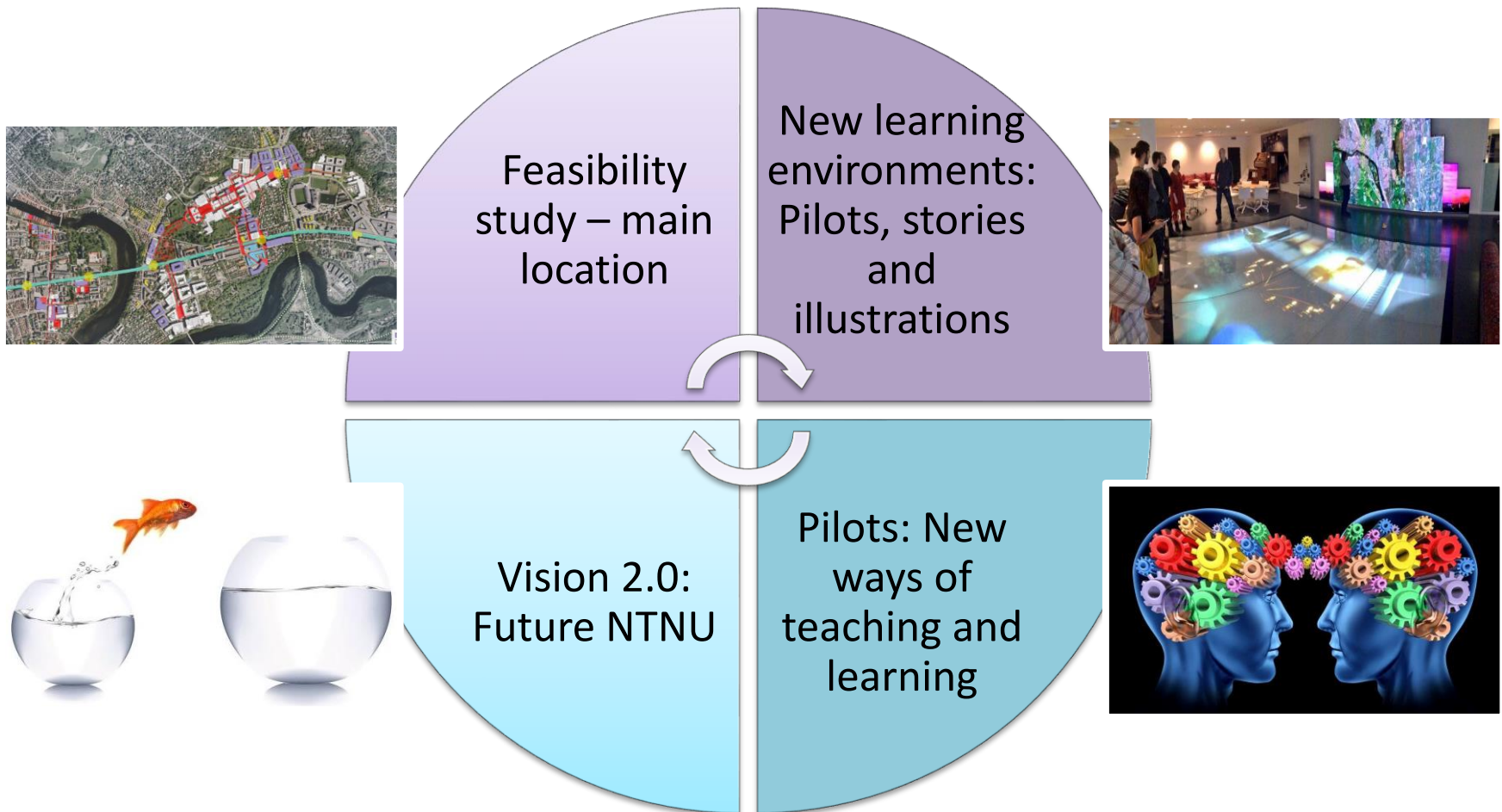
August 2015



September 2015

NTNU campus

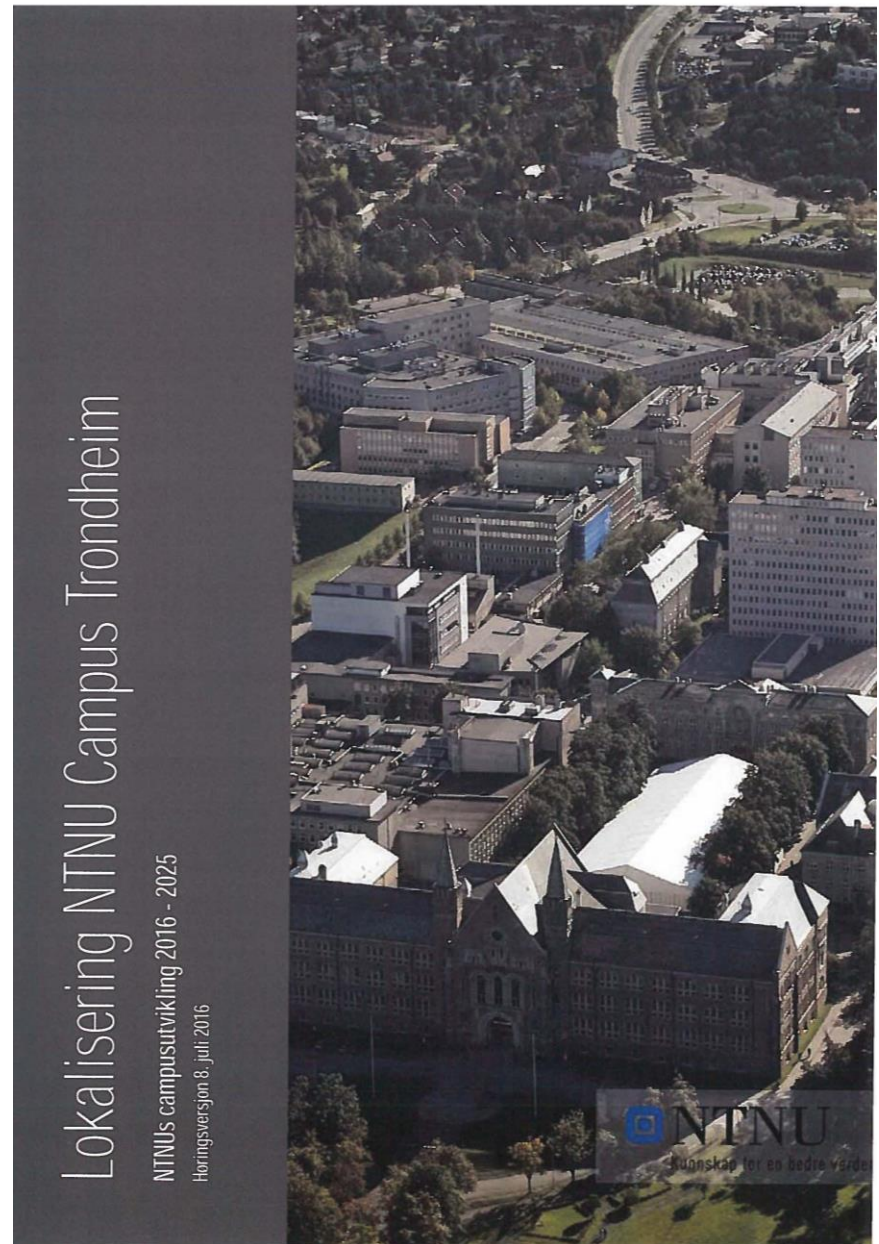
Further development 2015 - 2016



NTNU Campusdevelopment 2016-2025

Report 8. July 2016 Recommendation location NTNU Campus

<https://www.ntnu.no/campusutvikling>



Five main trends being of particular interest to the dual theme of university and campus development seen from an international perspective.

1. Universities have to be attractive in a borderless world
2. New education forms and learning environments are needed
3. Students increase in numbers and mobility, representing a broader range of the population both regarding age and social situation
4. There is a need for integration of education, research and innovation into a 'knowledge triangle'

5. In a strategic campus development perspective, buildings can be seen as functional frameworks for human activity, and thus, that ideas about university space should be reconsidered as activities and demands on performance changes (Bygningsstyrelsen 2009, Den Heijer 2011, Beckers et al., 2015).

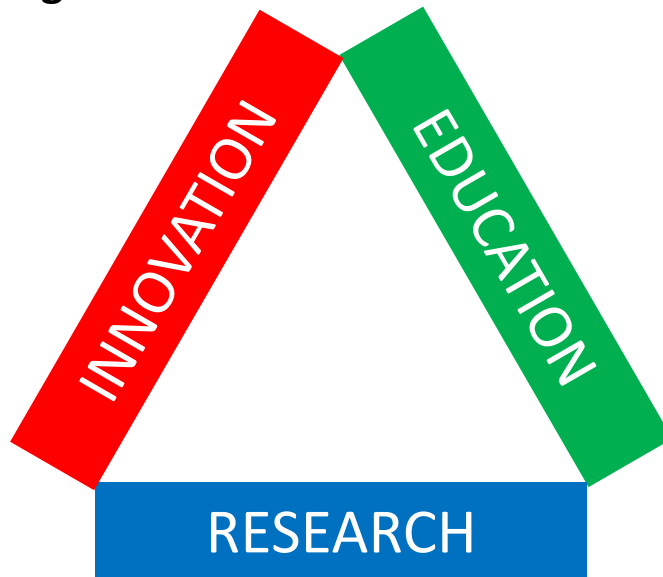
These changes involve altering needs for working spaces such as classrooms, offices, laboratories, workshops and for social spaces.

Campus development – and FM

Analysing trends in education



The knowledge triangle



Changing student - teacher interaction

Student-centred thinking

Multidisciplinary

Close to practice

Teamwork and experimentation

Virtual work forms

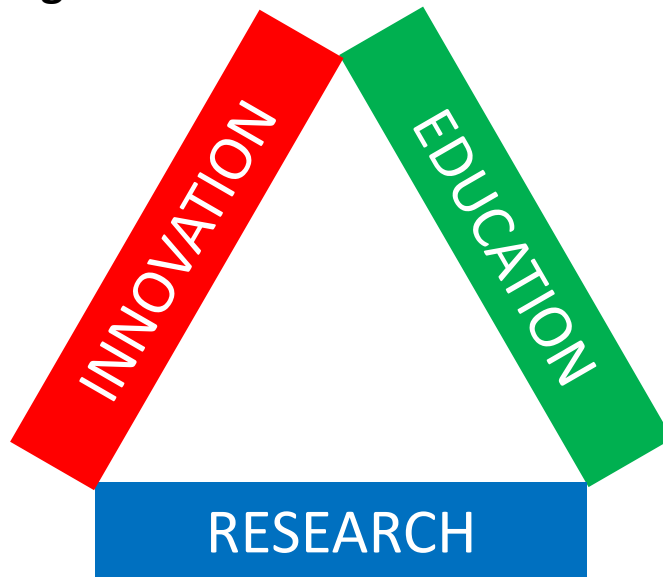
Mobility

NTNU Priority : Effectiveness - space use – mixed activities - urban

Development of a theoretical framework

Analysing trends in research

The knowledge triangle



Multidisciplinary

Close to practice

Virtual work forms and mobility

Experimental

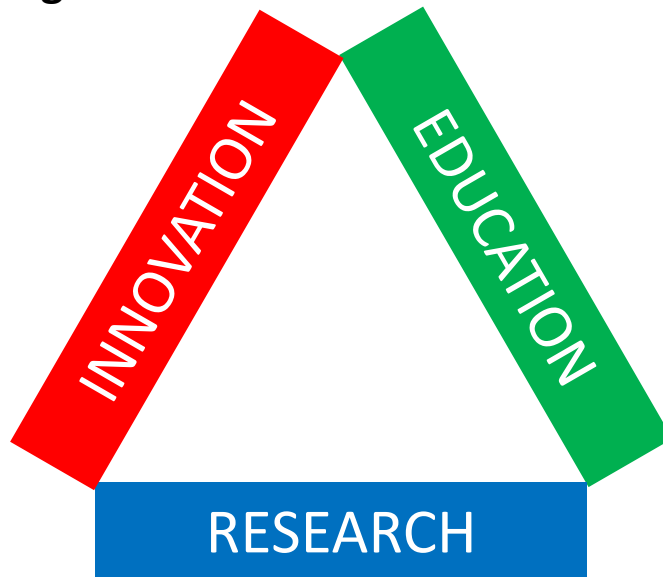
Centre establishments

NTNU Priority : Networking – nodes – meeting places

Development of a theoretical framework

Analysing trends in Innovation

The knowledge triangle



Multidisciplinary

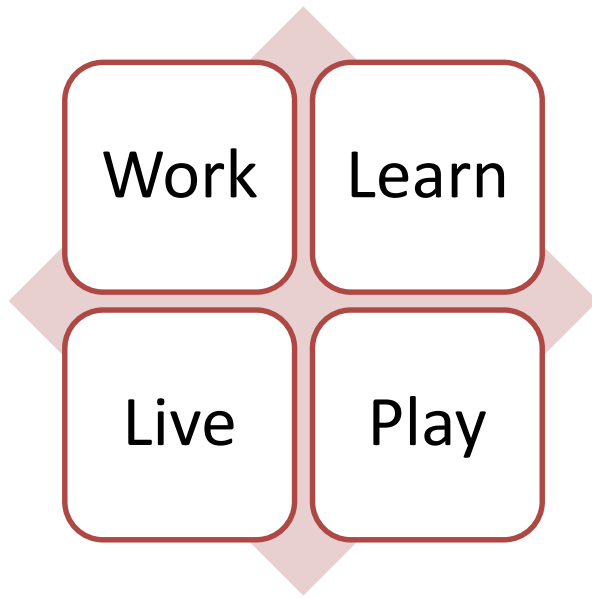
Experimental

Close to working life and society

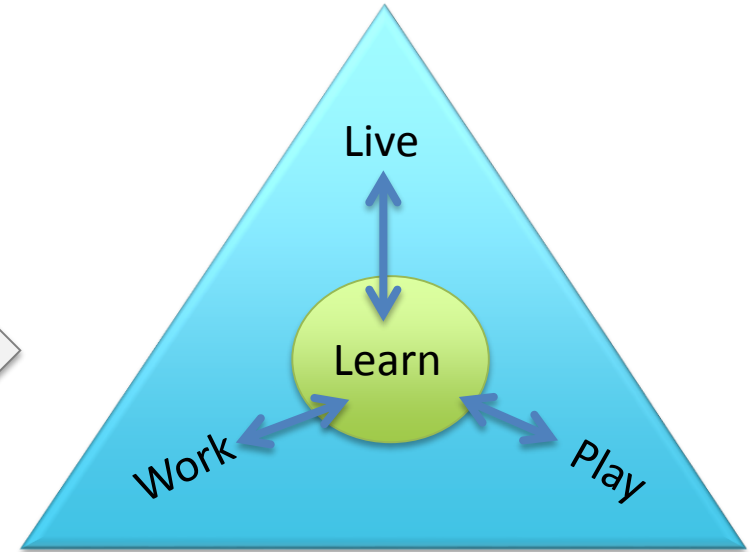
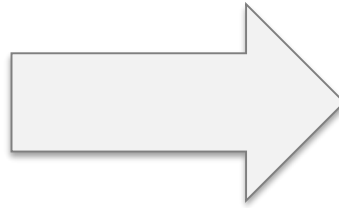
Centre establishments

NTNU Priority : Networking – Innovation centre

Learning and living 24/7



Before:
Everyday life divided into
separate activity zones

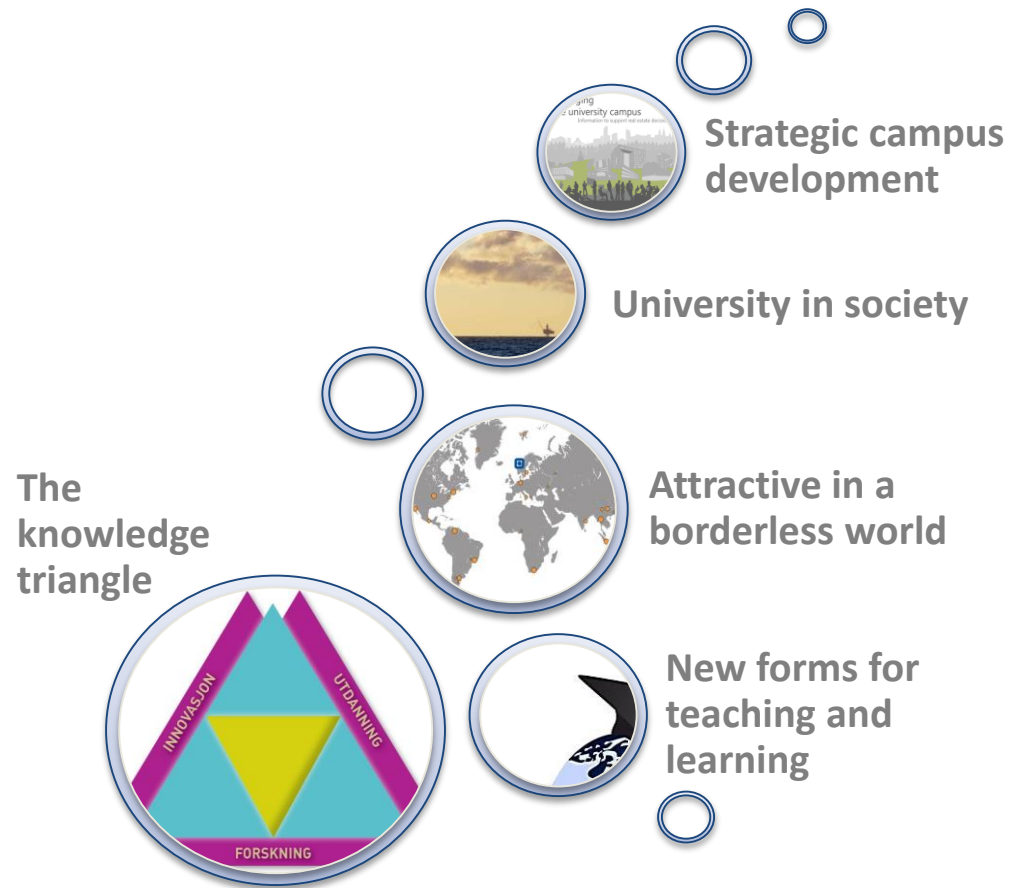


Today:
Different parts of everyday life
become integrated through
learning

**- Consequently, ideas
about campus must also
change**

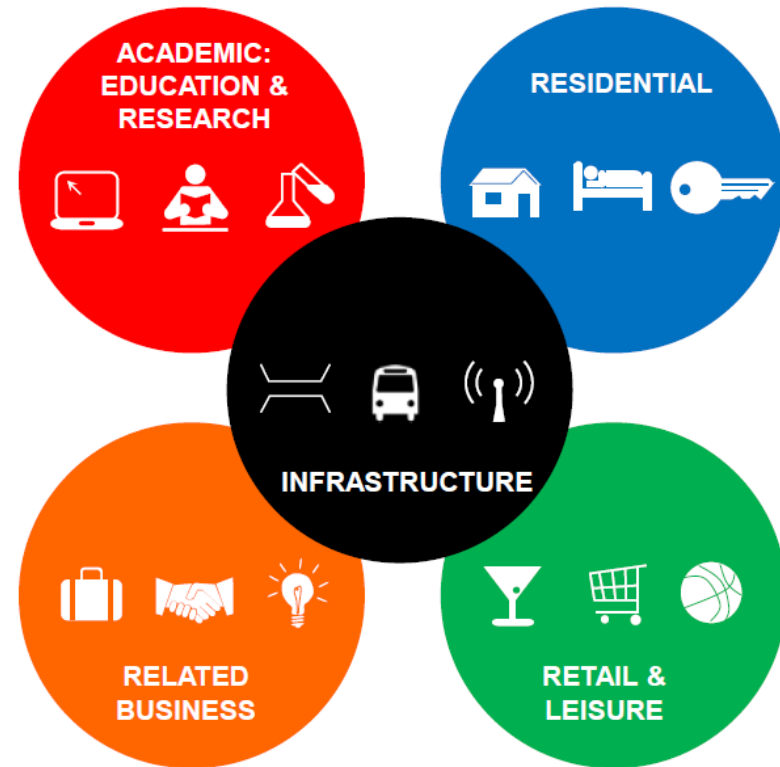
Trends interpreted – what we need

- Attractive, available and shared meeting places for formal and informal learning
- Flexible premises easily adaptable to new purposes
- Open areas for visibility and availability of learning
- Co-location of different activities and functions, areas used by various groups
- Co-location and short distance between activities



- the functional definition of "campus" must change

- **ACADEMIC**
classrooms, library, offices,
laboratories, lecture halls, ...
- **RESIDENTIAL**
student housing, hotels, ...
- **RELATED BUSINESS**
start-ups, incubators, industry, ...
- **RETAIL & LEISURE**
sports, restaurants, cafes, ...
- **INFRASTRUCTURE**



© Alexandra den Hejer, MSc PhD, TU Delft - <http://managingtheuniversitycampus.nl/>

Co-localization as enabling factor

Proximity

- enables better use of experimental areas and educational facilities, as well as of common services.

Teamwork and experimentation

Co-localization and public meeting places stimulates cooperation across traditional organizational and disciplinary borders.

Multidisciplinary

Accessible and attractive meeting places facilitates communication in and across communities of practice.

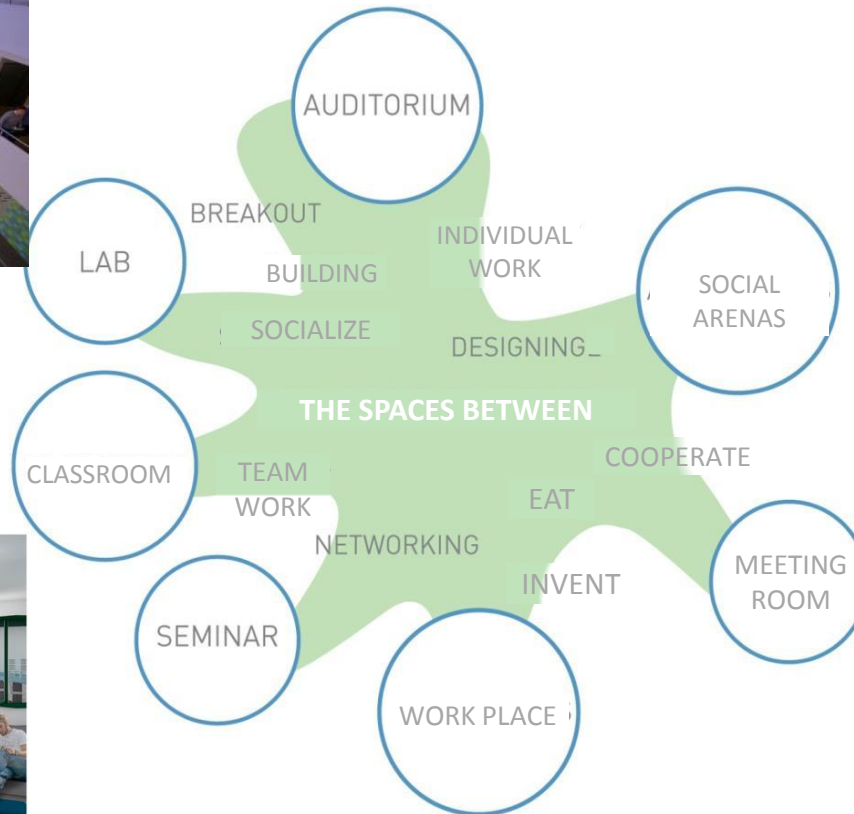
Close to working life and society

Distance

Administration and educational planning are impeded by travel time and geographical distance.

Geographical distance inhibits students opportunity of selecting topics across traditional organizational and disciplinary borders.

Innovative work processes – integrated, multidisciplinary, productive



Existing campus: Develop active spaces in between



Urban character - attractive and open



Networking - Visible knowledge development



Effective space use – Flexible areas for teaching and learning





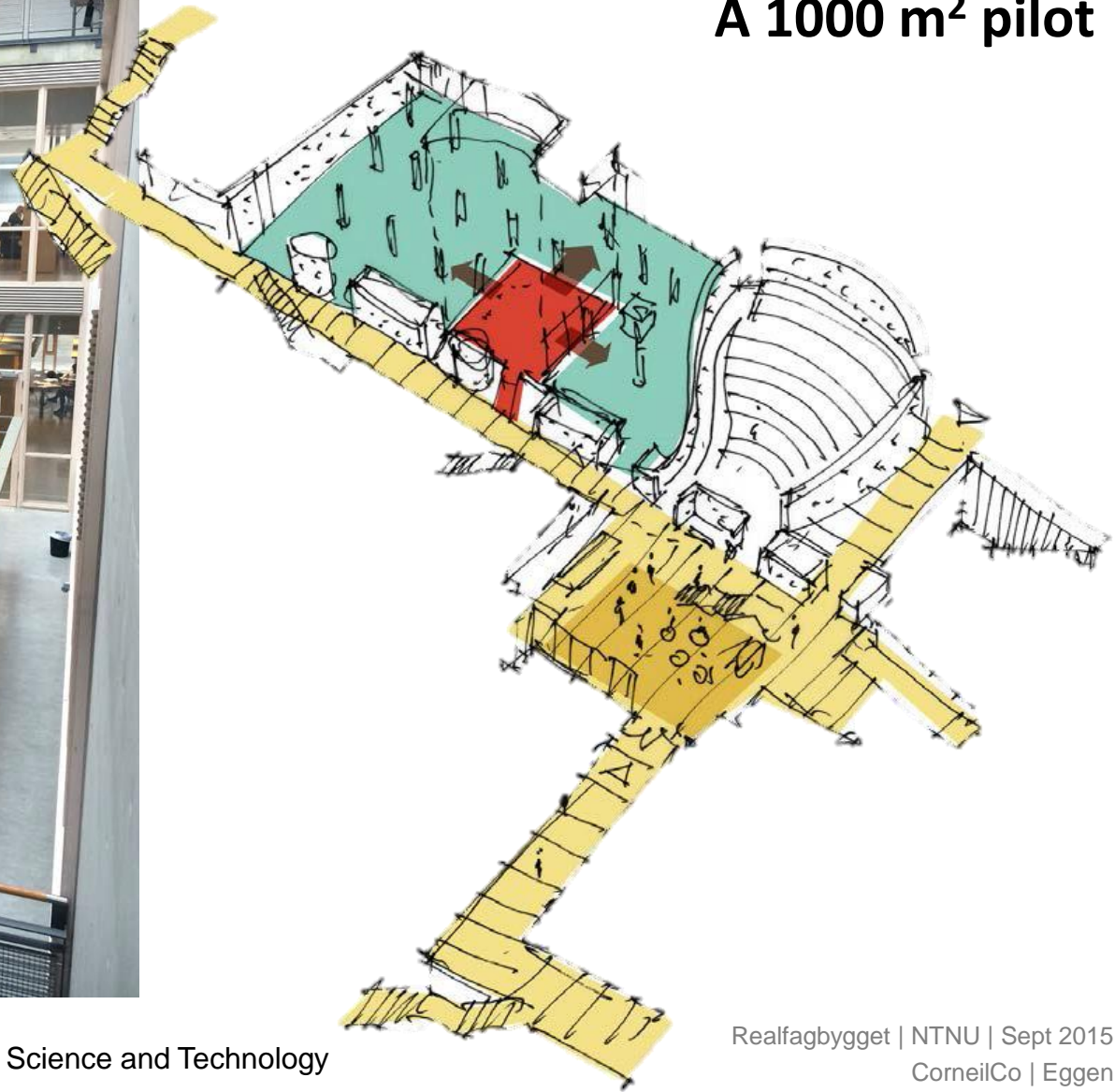


FURTEHER RESEARCH PILOT Library project

NTNU | Sept 2015

Corneil Collaborative | Eggen Arkitekter

Innovative learning areas and informal meeting places: A 1000 m² pilot



ALTERNATIVES



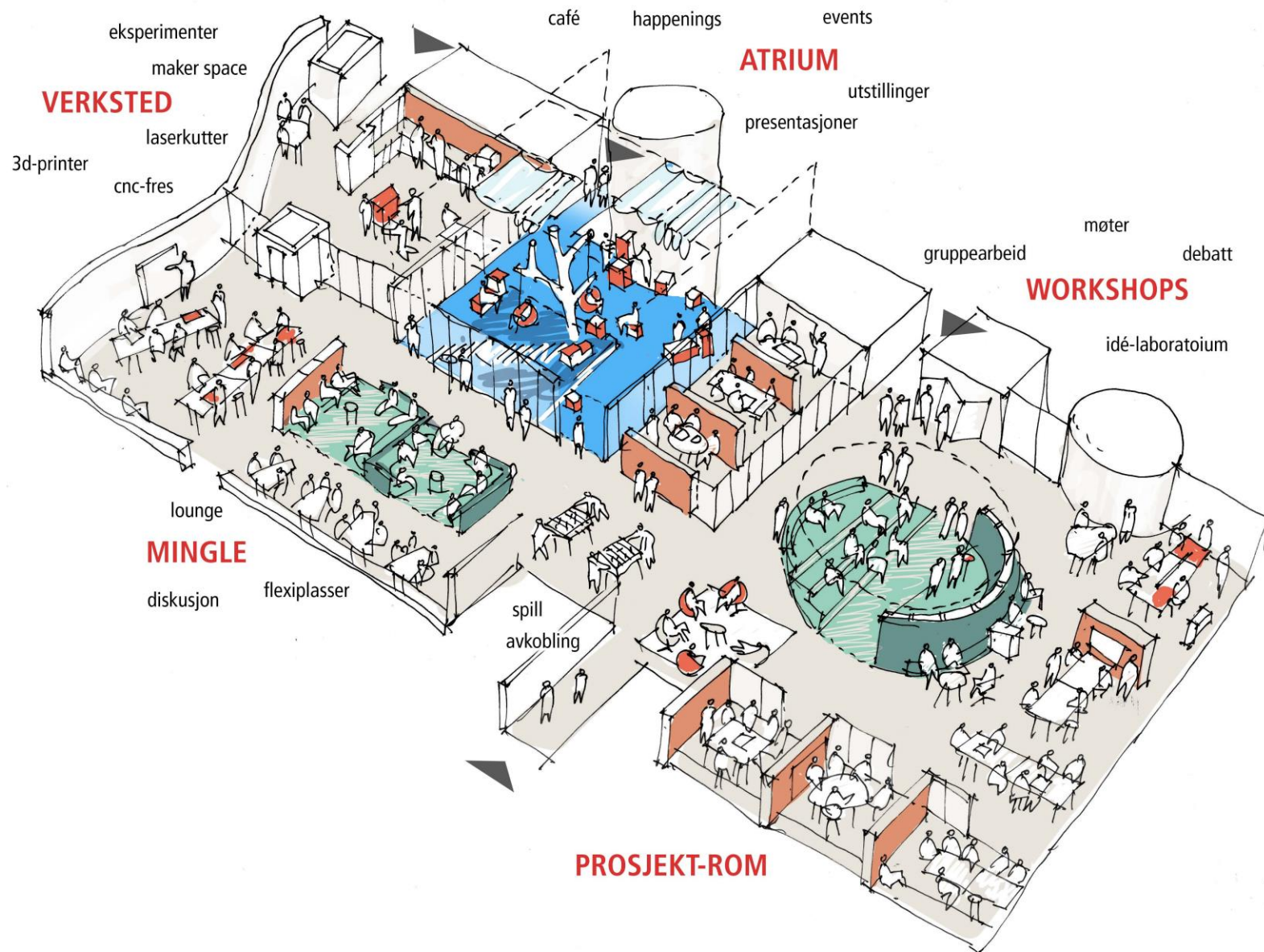
#1:
ENGAGE



#2:
MAKE



#3:
CONNECT

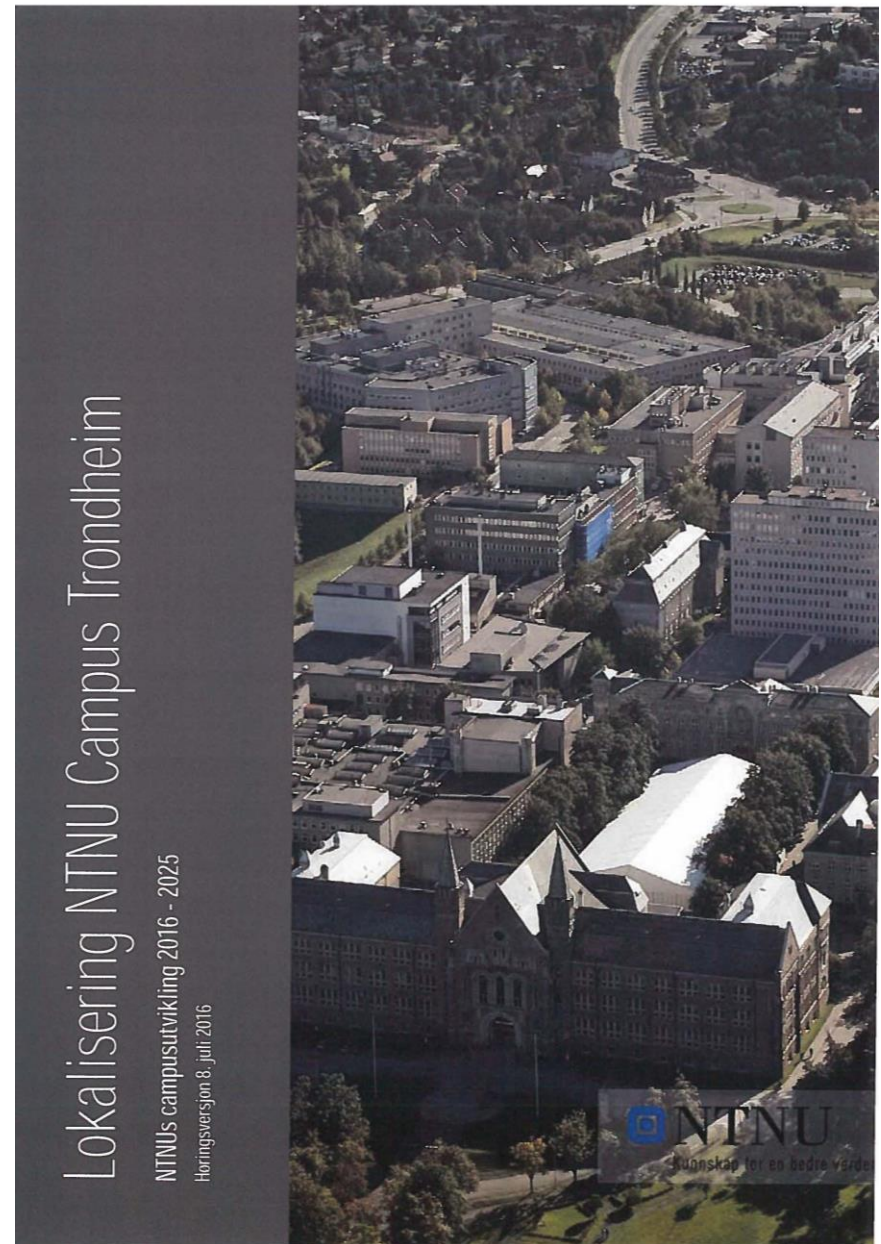




NTNU Campusdevelopment 2016-2025

Report 8. July 2016 Recommendation future location NTNU - Trondheim

<https://www.ntnu.no/campusutvikling>

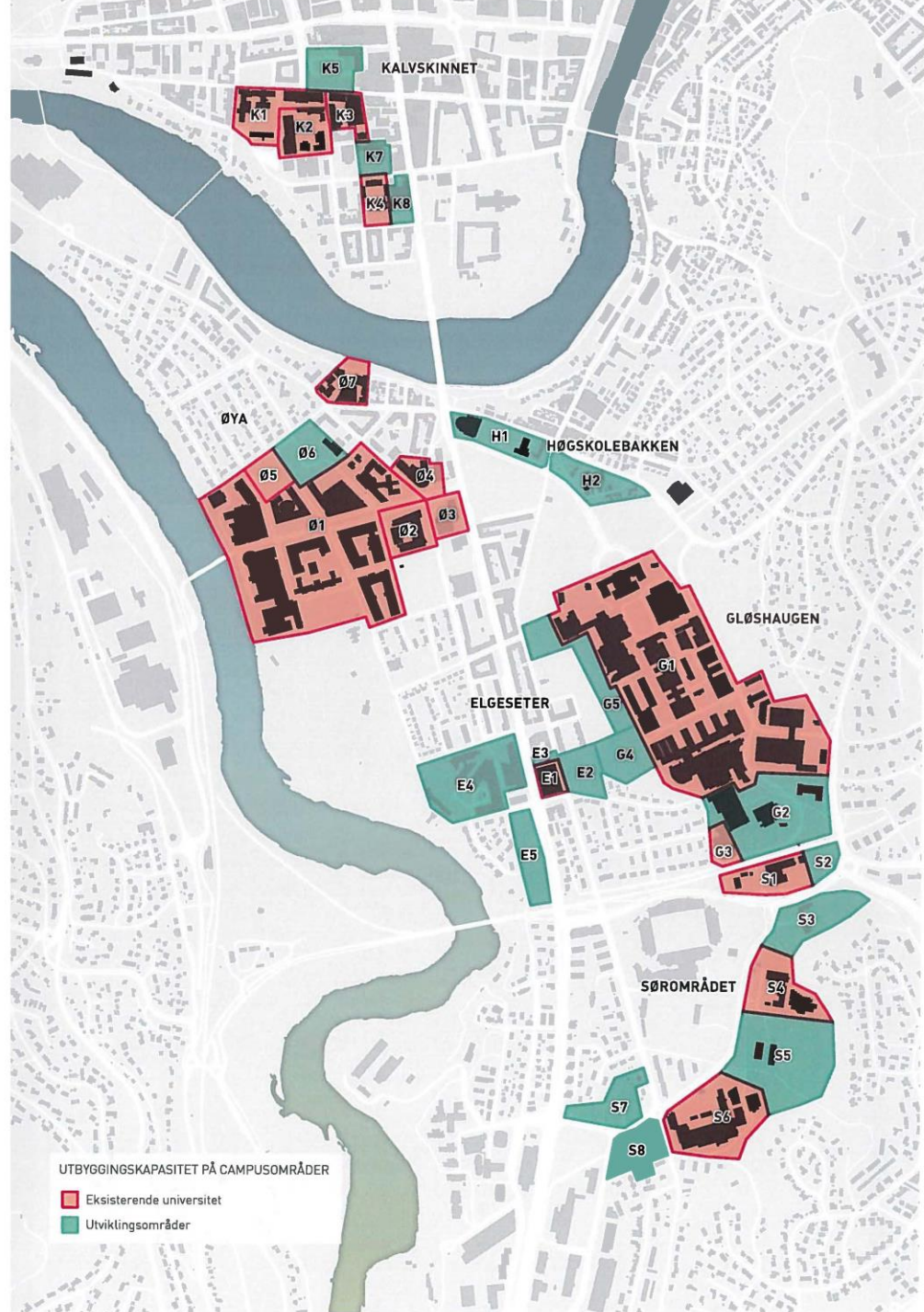


- Trondheim

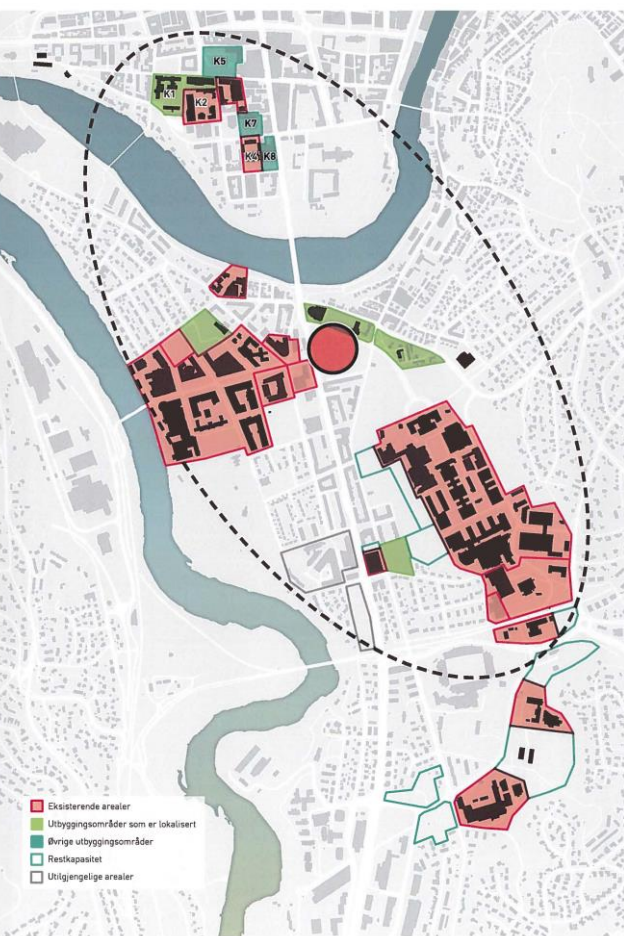
Midtbyen

Geotechnical - risk analysis

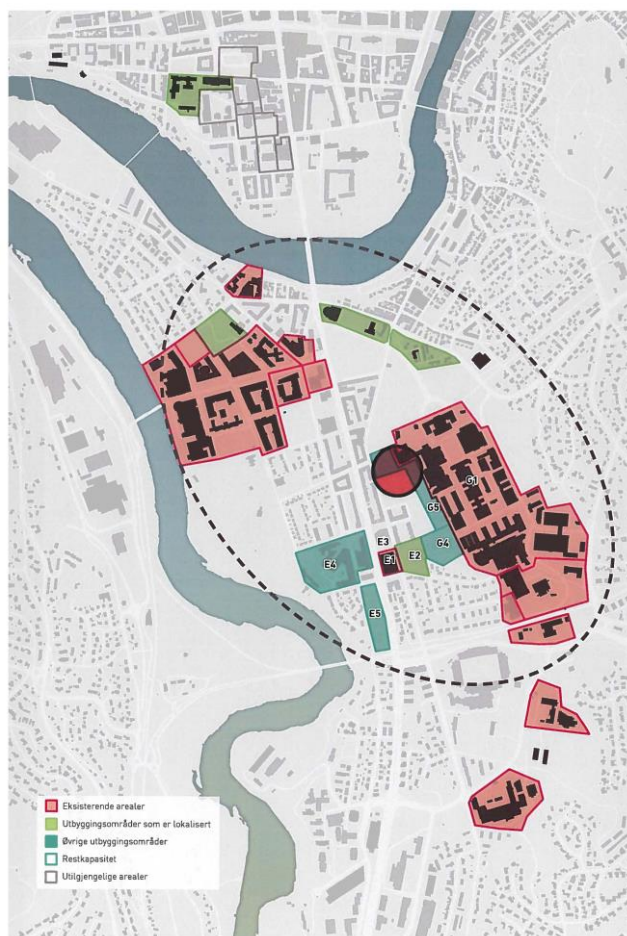
- Svært krevende geoteknisk / tiltak medfører uforholdsmessig høye kostnader
- Krevende geoteknisk, bør utredes nærmere
- Sannsynlig moderat krevende geoteknisk, bør utredes nærmere
- Ingen spesielle geotekniske utfordringer



NTNU 2060 - Main alternatives for location and development



North - Kalvskinnet



Vest - Elgeseter



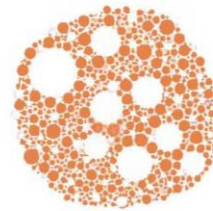
South - of Gløshaugen

From NTNU Vision 2060 =>

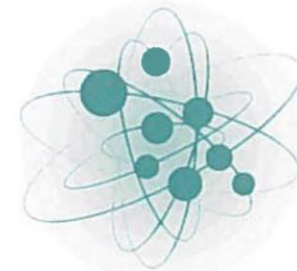
Six main components (principles) for campus development and qualities

NTNU: kunnskap for en bedre verden

- Campus NTNU er de fysiske rammene for internasjonalt fremragende undervisning, forskning, innovasjon og formidling
- Campus NTNU tiltrekker seg de dyktigste studentene, medarbeiderne og partnerne



LEVENDE
LABORATORIUM



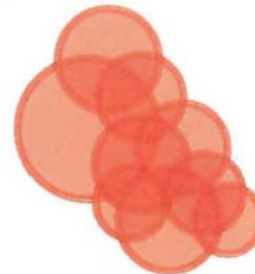
SAMLENDE



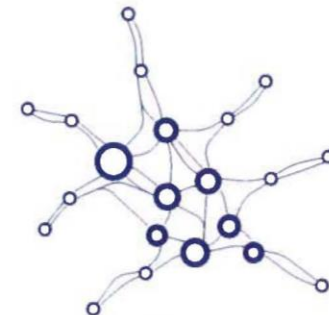
BÆREKRAFTIG



URBAN



EFFEKTIV

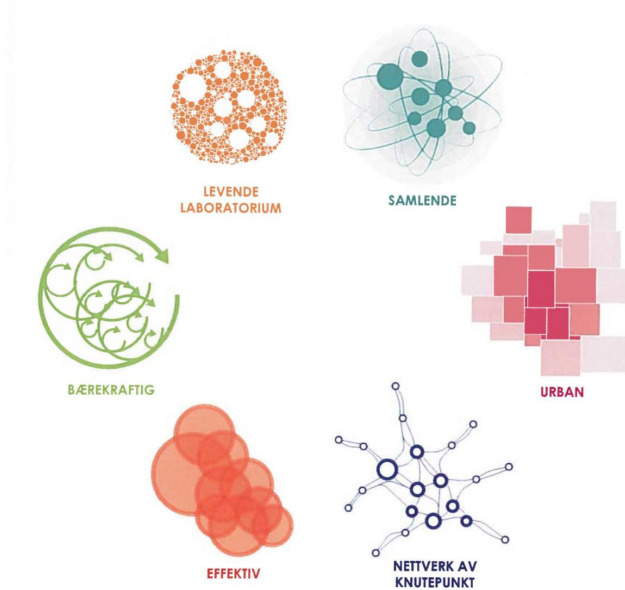


NETTVERK AV
KNOTEPUNKT



2016-07-08

Recommended location for campusdevelopment



- **Kalvskinnet – HIST**
New technology building 16,000 m²
Statsbygg 2015
(in line for founding since 2003 !)

2016 => NTNU campus

- capacity for new use
- flexibility
- adaptability



STATSBYGG

Nytt teknologibyg

Oppdragsgiver: Kunnskapsdepartementet
Ferdigstillelse: desember 2016

Byggherre Statsbygg

Prosjektledelse	Statsbygg
Byggherreombud	Rambøll Norge AS
Totalentreprenør	Betonmast Trøndelag AS
Arkitekt	Slyngstad Aamlid Arkitekter AS
Rådgivende ingeniør	Norconsult AS
Rådg. ing. bygg	THiLT Engineering AS
Totalteknisk entreprenør	Caverion AS
Grunntentreprenør	Ottar Augdal AS
Betongarbeider	Spennarmering AS
Spuntarbeid	FAS

Tlf. 815 55 045 www.statsbygg.no

NTNU campus – a living laboratory



**ZEBs 'Living Laboratory' –
testing occupant behavior
user experiences**

**NTNU og SINTEF –
New ZEB
laboratory building**
-
**New ZEN – centre
Zero emission
neighbourhood**



Short summing up

- Campus development is no longer about the construction of lecture halls, reading rooms and offices.
- For NTNU, campus development is an important strategic tool to attract and keep excellent researchers, teachers and students.
- The demand for a space that supports the fundamental characteristics of experimentation, interdisciplinary work, education programs and collaboration with private and public organizations is urgent.
- More research and pilot studies are needed to understand the interaction between education, research and innovation – for planning, new construction and FM - of the University Campus of the Future !



Thank you for your attention!