



## Advantages when changing to a nationwide reference system

- Experiences from Umeå, a municipality in northern Sweden

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FIG Working Week, Stockholm June 14-19 2008

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Background

The change of reference system

Experiences

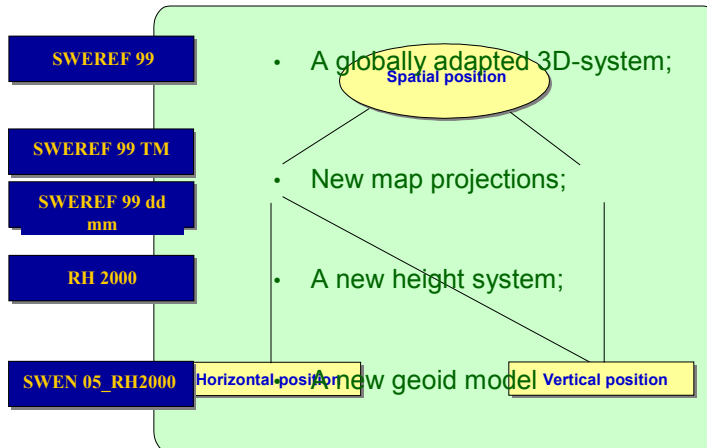
Advantages



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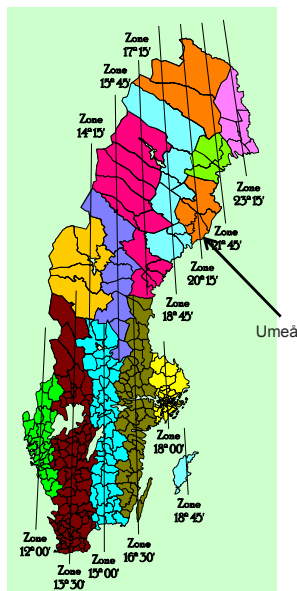
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## New geodetic reference systems



## Projection Zones

for large scale mapping and cadastral works



### Certified zones

- central meridian
- x- and y-additions (false origin)
- area of validity



### Umeå in figures

Umeå was founded in year 1622  
Inhabitants: 111 000, 65% lives in the population centre  
Area: 5 253 km<sup>2</sup>  
Located 663 km north of Stockholm



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## The change of horizontal reference system

Local system → SWEREF 99 20° 15'

-Several slightly different local reference systems throughout the municipality.

-We used a two-dimensional similarity transformation (Helmert).



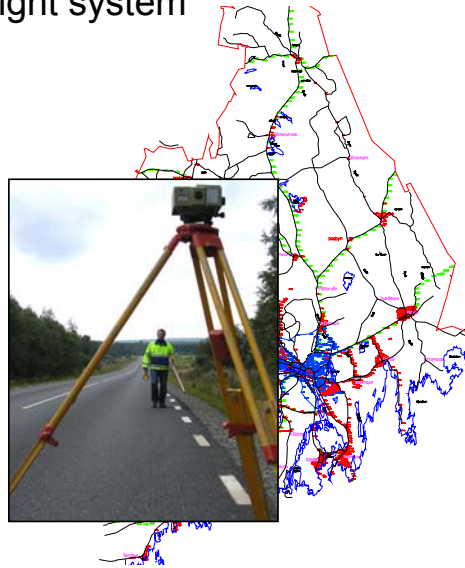
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## The change of height system

Local height system → RH 2000

- About 1700 benchmarks
  - Green: national levelling
  - Blue: relative newly calculated b-m
  - Red: older height networks
- Complementing measurements to connect networks.



## Experiences

- Create a time plan
- Acceptable distortions for your applications?
- Decide what kind of transformation or model you should use
- Informing all the users of co-ordinates
- No mix up!
- Transformation services
- Co-operation

## Advantages

- The networks of defined points are more homogeneous and accurate
- More efficient use of GPS/GNSS
- No need for transformations – higher accuracy
- Uncomplicated exchange of geographical data
- Lower costs

Thank you for your attention!

