

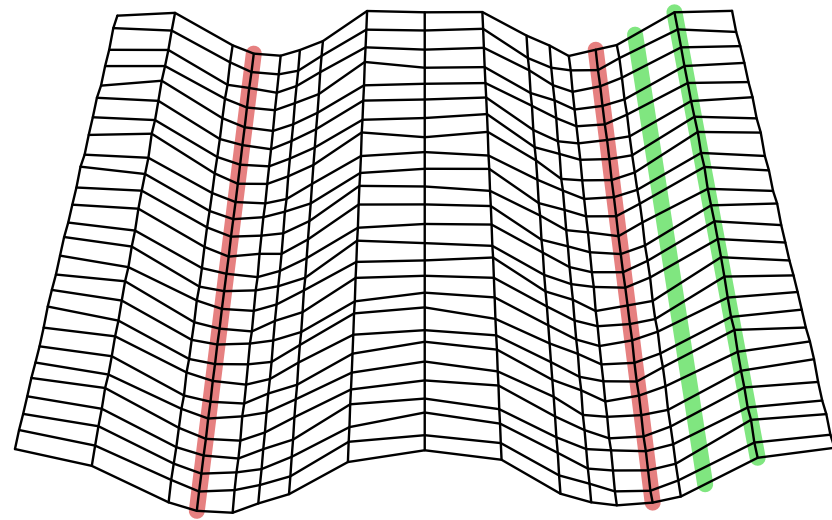


BUDAPEST
HUNGARY
2015

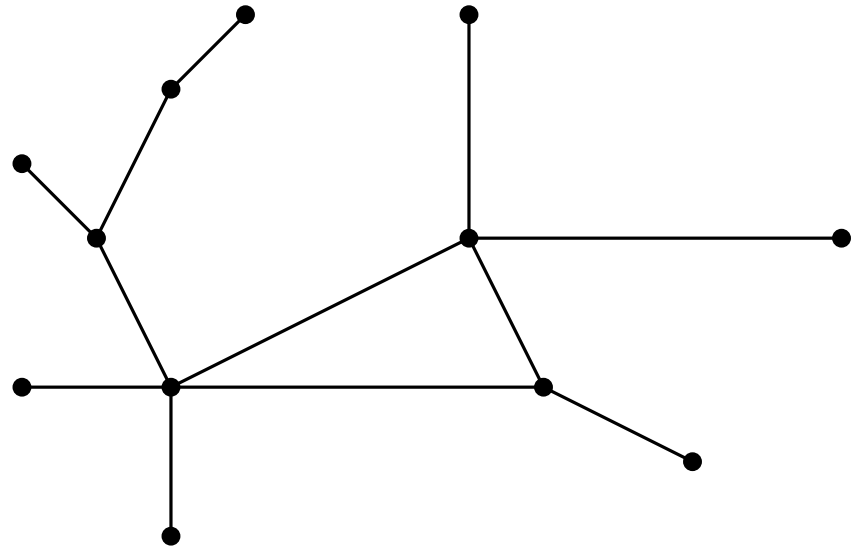
MPD/IRI Transverse Position

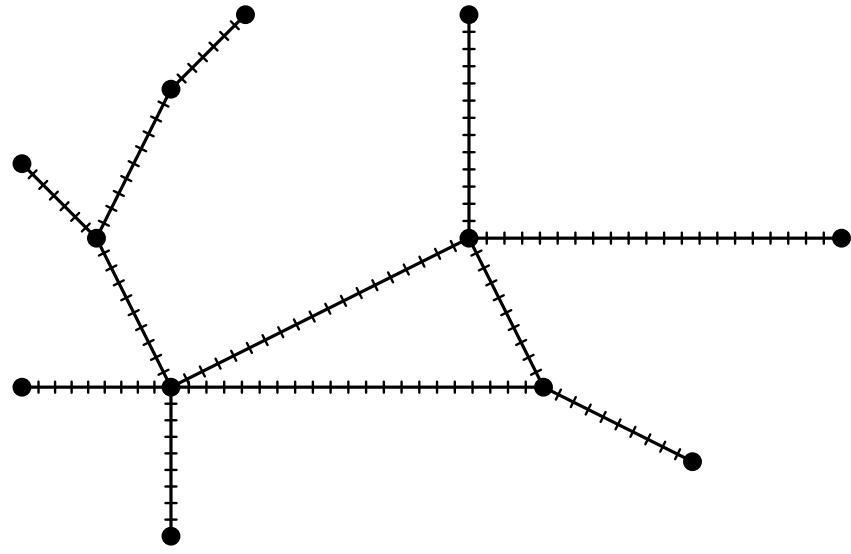
Olle Eriksson
olle.eriksson@vti.se

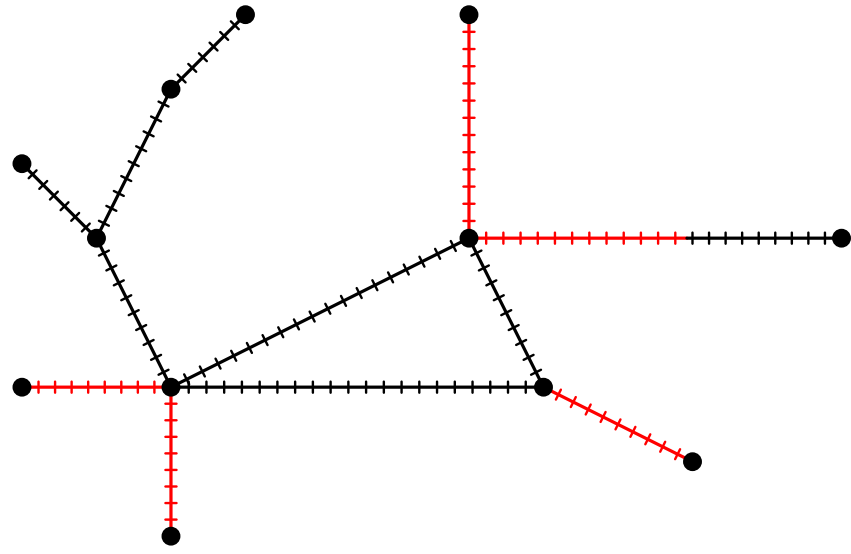
Thomas Lundberg
thomas.lundberg@vti.se



- Y , Y_{25} and Y_{45}
- $Y_{25} = \beta_0 + \beta_1 Y + \epsilon$
- $Y_{25} = \beta_0 + \beta_1 Y + \beta_2 X_1 + \beta_3 X_2 + \epsilon$
- $Y_{25} - Y = \beta_0 - \beta_1 X_1 + \beta_2 X_2 + \epsilon$

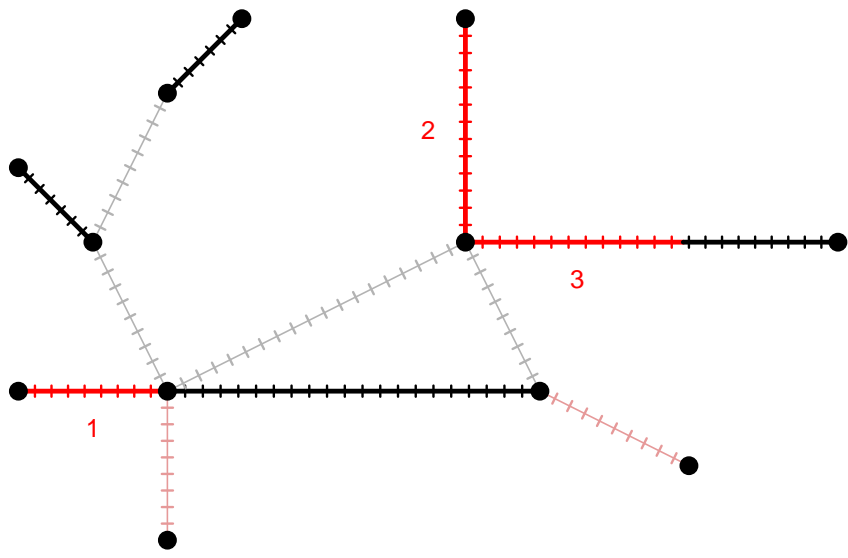






- A road/section is a cluster of segments
- A segment is an element
- A road/section is a sampling unit
- Sampling in a first stage only

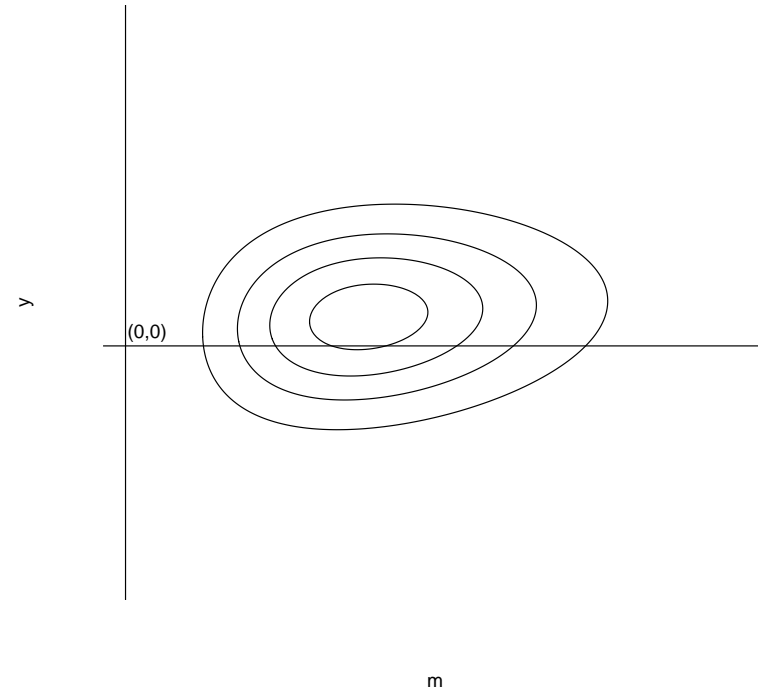
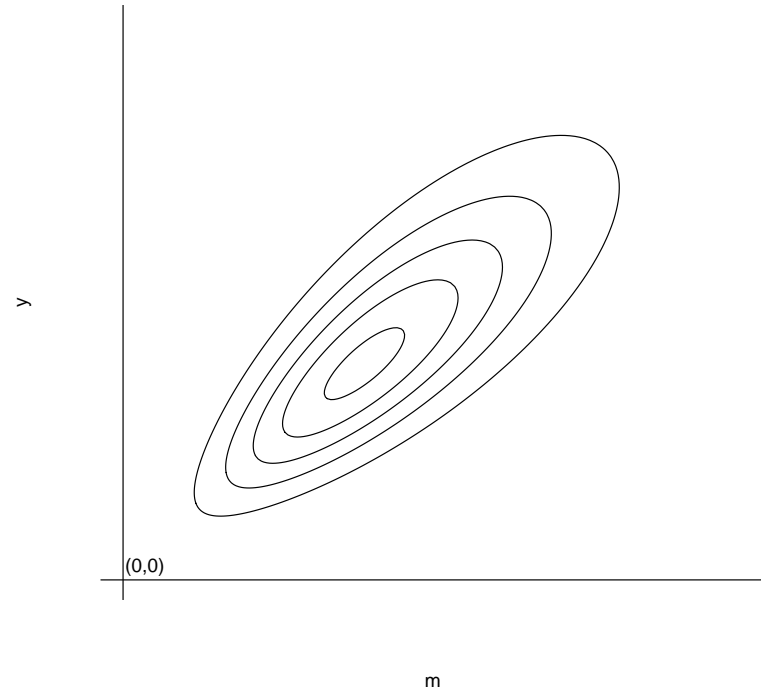
- N the number of clusters in the population
- n the number of clusters in the sample
- m_i the number of elements in road i
- \bar{m} the average cluster size in the sample
- \bar{M} the average cluster size in the population
- y_i the total of all observations in cluster i



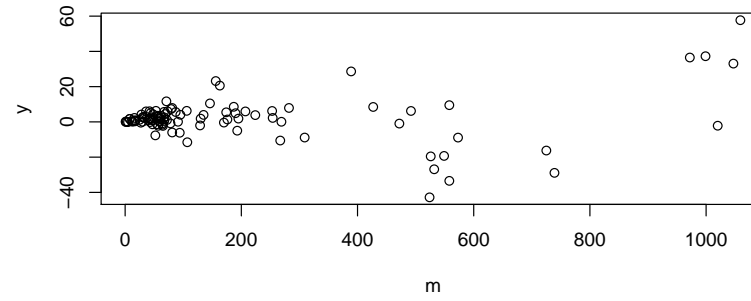
- $$\mu = \frac{\sum_{i=1}^N y_i}{\sum_{i=1}^N m_i}, \quad \hat{\mu} = \frac{\sum_{i=1}^n y_i}{\sum_{i=1}^n m_i}$$

- $$\hat{V}_{\hat{\mu}} = \frac{N-n}{N} \cdot \frac{1}{n} \cdot \frac{1}{\bar{M}^2} \cdot \frac{\sum_{i=1}^n (y_i - \hat{\mu}m_i)^2}{n-1} \approx \frac{1}{n} \cdot \frac{1}{\bar{m}^2} \cdot \frac{\sum_{i=1}^n (y_i - \hat{\mu}m_i)^2}{n-1}$$

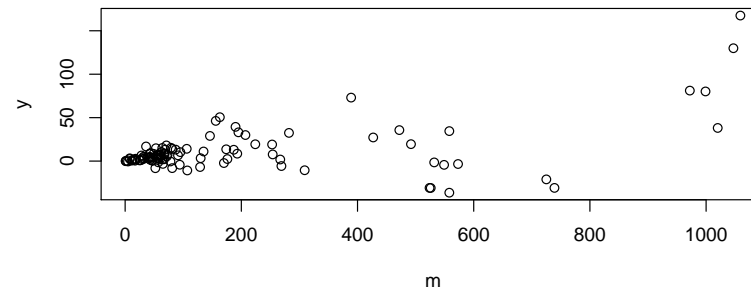
- Error margin $2\sqrt{\hat{V}_{\hat{\mu}}}$



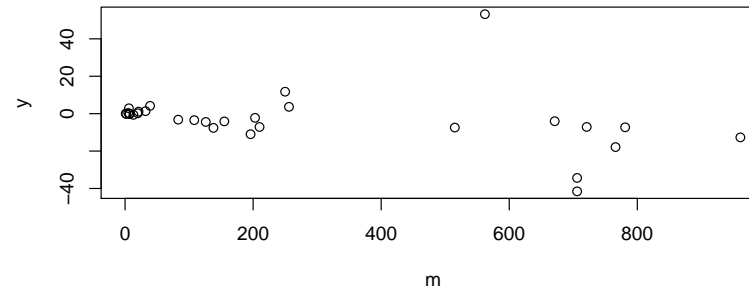
Stone Mastic Asphalt, MPD, (25-0)



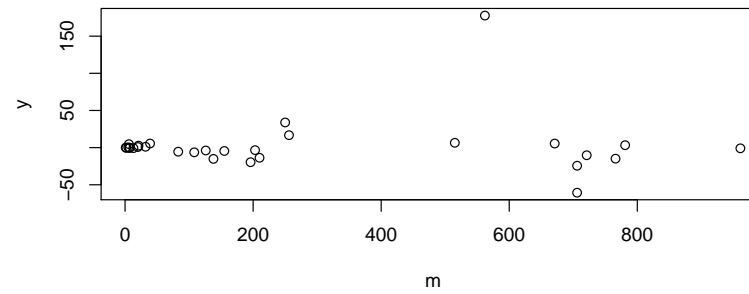
Stone Mastic Asphalt, MPD, (45-0)



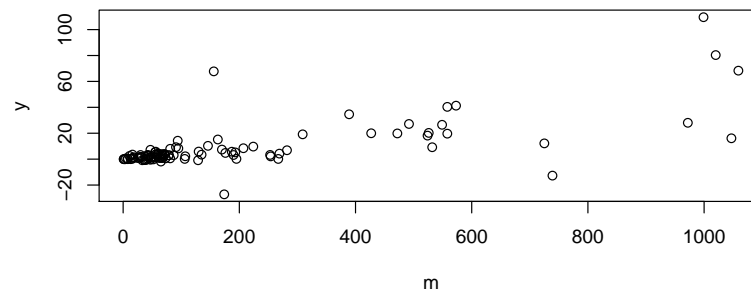
Hard Binder, Stone Mastic Asphalt, MPD, (25-0)



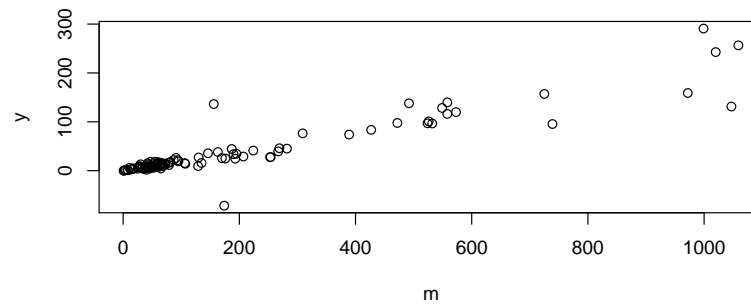
Hard Binder, Stone Mastic Asphalt, MPD, (45-0)



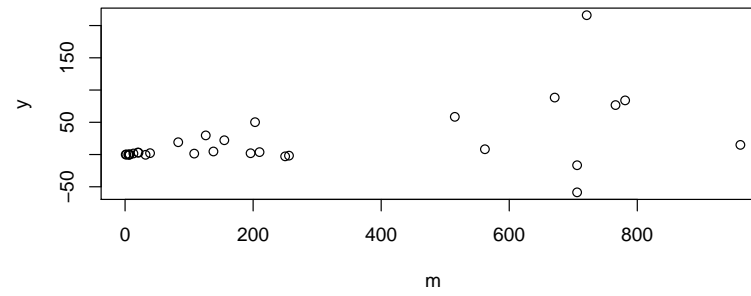
Stone Mastic Asphalt, IRI, (25-0)



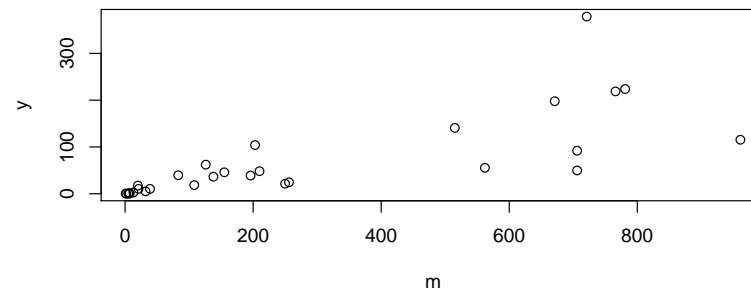
Stone Mastic Asphalt, IRI, (45-0)



Hard Binder, Stone Mastic Asphalt, IRI, (25-0)



Hard Binder, Stone Mastic Asphalt, IRI, (45-0)



MPD, $Y_{25} - Y$

	SD within	SD between	Mean difference	Error margin
Stone Mastic Asphalt	0.080	0.047	0.011	0.013
Hard Binder, Stone Mastic Asphalt	0.070	0.027	0.021	0.014
Dense Asphalt Concrete	0.089	0.040	-0.012	0.019
Hard Binder, Dense Asphalt Concrete	0.090	0.093	0.033	0.084
Soft Binder, Dense Asphalt Concrete	0.101	0.042	0.002	0.033
Asphalt Concrete, Binder Course	0.093	0.018	-0.020	0.029
Thin Surface Course System	0.116	0.045	-0.019	0.040

MPD, $Y_{45} - Y$

	SD within	SD between	Mean difference	Error margin
Stone Mastic Asphalt	0.126	0.086	0.059	0.024
Hard Binder, Stone Mastic Asphalt	0.110	0.053	0.038	0.028
Dense Asphalt Concrete	0.128	0.097	0.009	0.048
Hard Binder, Dense Asphalt Concrete	0.113	0.200	0.085	0.180
Soft Binder, Dense Asphalt Concrete	0.135	0.071	-0.030	0.062
Asphalt Concrete, Binder Course	0.145	0.031	-0.011	0.046
Thin Surface Course System	0.160	0.068	0.013	0.059

IRI, $Y_{25} - Y$

	SD within	SD between	Mean difference	Error margin
Stone Mastic Asphalt	0.259	0.053	0.044	0.014
Hard Binder, Stone Mastic Asphalt	0.327	0.074	0.114	0.067
Dense Asphalt Concrete	0.248	0.104	0.074	0.057
Hard Binder, Dense Asphalt Concrete	0.146	0.020	0.071	0.012
Soft Binder, Dense Asphalt Concrete	0.635	0.178	0.419	0.151
Asphalt Concrete, Binder Course	0.318	0.131	0.206	0.209
Thin Surface Course System	0.143	0.032	0.010	0.029

IRI, $Y_{45} - Y$

	SD within	SD between	Mean difference	Error margin
Stone Mastic Asphalt	0.675	0.108	0.196	0.026
Hard Binder, Stone Mastic Asphalt	0.492	0.059	0.238	0.044
Dense Asphalt Concrete	0.356	0.145	0.238	0.075
Hard Binder, Dense Asphalt Concrete	0.232	0.020	0.212	0.019
Soft Binder, Dense Asphalt Concrete	0.849	0.169	0.696	0.111
Asphalt Concrete, Binder Course	0.402	0.196	0.355	0.324
Thin Surface Course System	0.197	0.053	0.133	0.051