



NordicWay

Cellular C-ITS Corridor

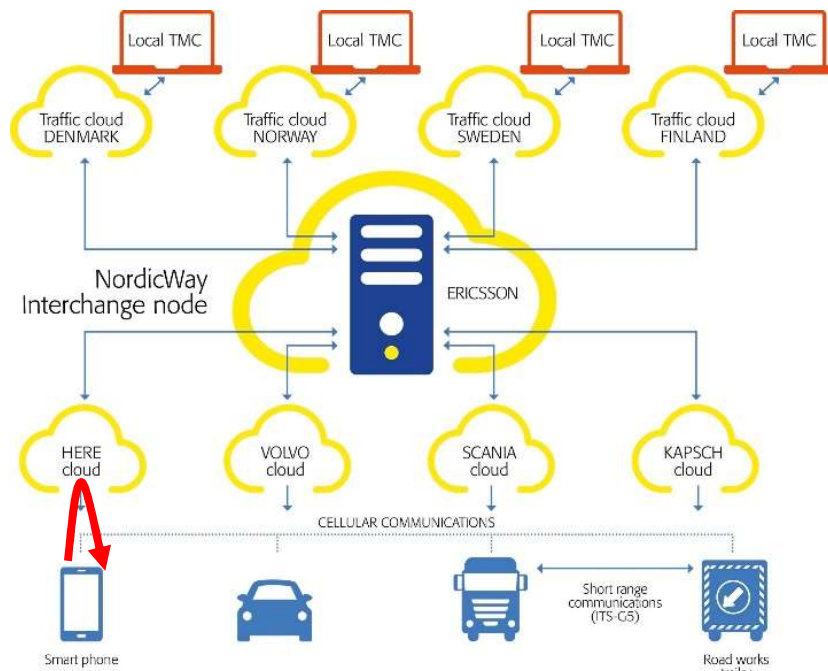
Technical Performance

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Latency of the mobile link



Latency smart phone – HERE cloud – smart phone

- Measured over all events during the piloting period (Sample size 1238)
- Latency for smartphone – HERE cloud-smartphone
- Median 0.3 s



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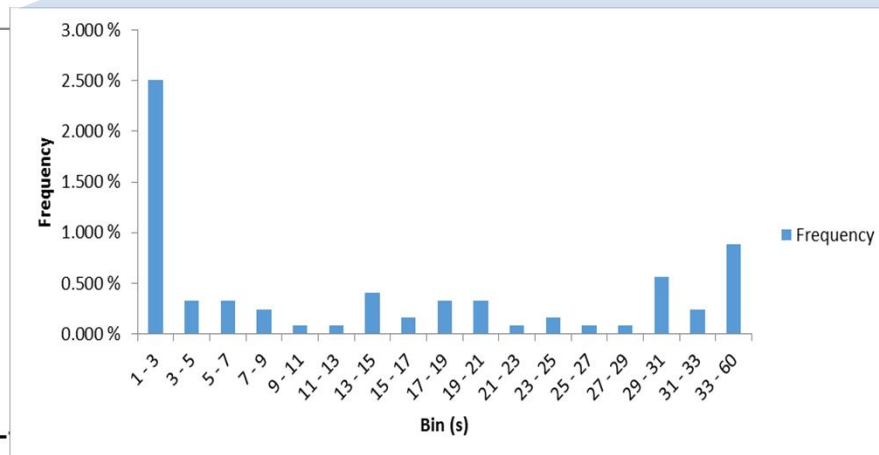
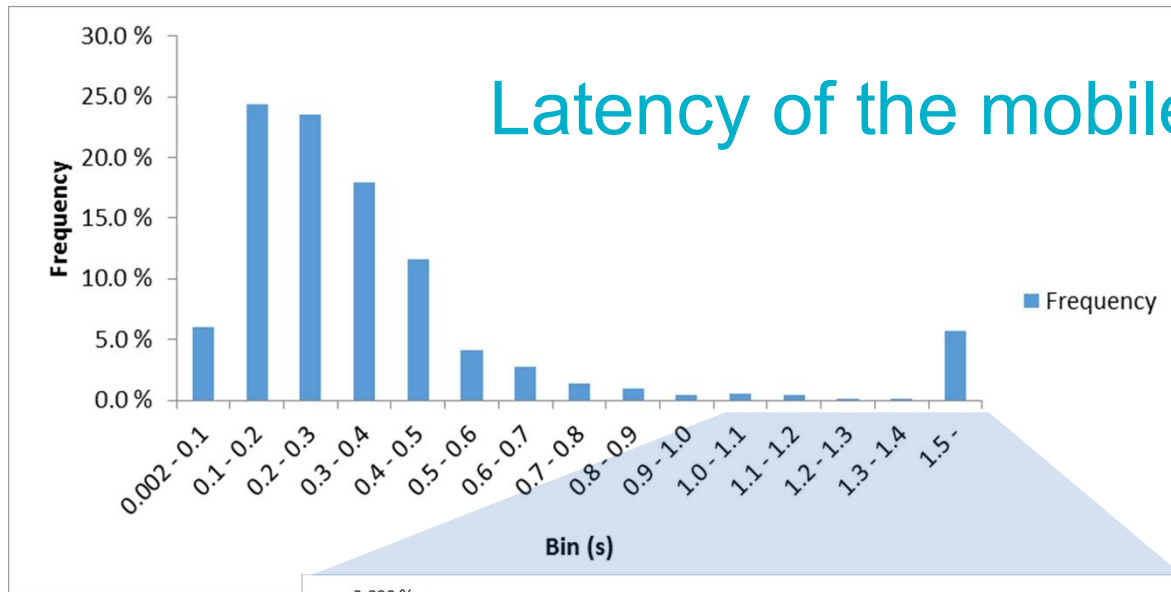
Latency of the mobile link



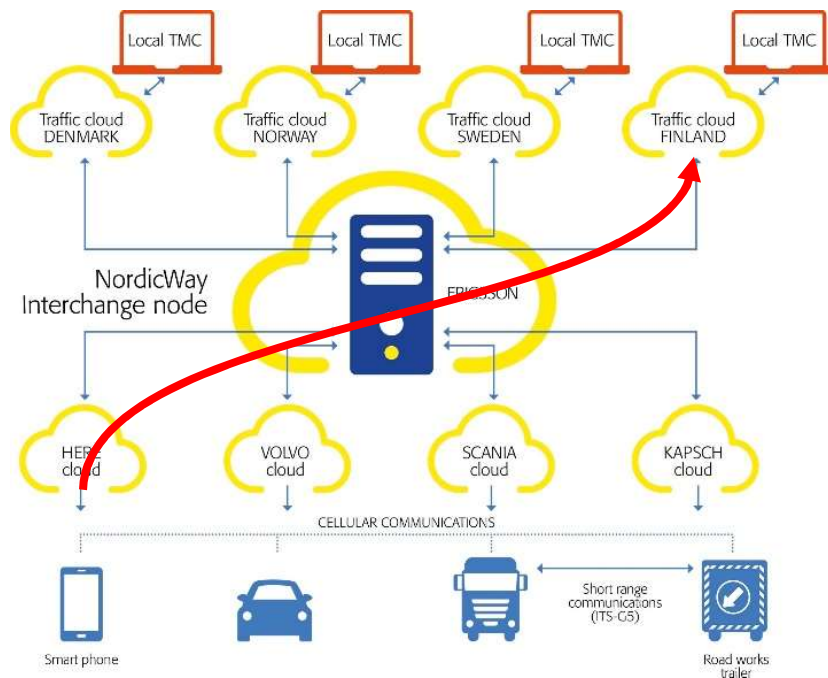
Measured over all events during the piloting period (Sample size 1238)

Latency for smartphone – HERE cloud-smartphone

- Median 0.3 s
- Average 1.4 s
- 90% under 0.7 s
- 93.1% under 1 s
- 96.5% under 10 s
- 0.5% more than 30 s



End-to-end Latency for the Coop-pilot

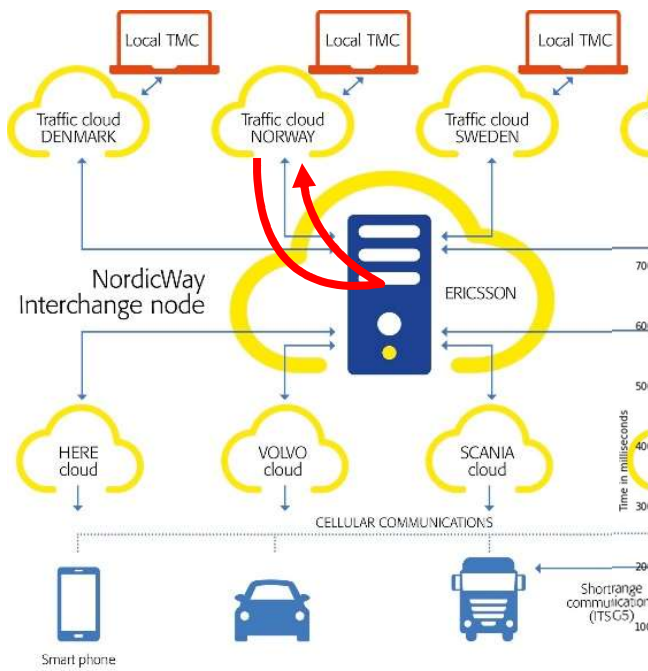


- From smartphone over HERE to Traffic Cloud (Infotripla)
 - Median 0.7s
 - Average 1.8 s
- From Traffic Cloud to end-users
 - Median 2 s



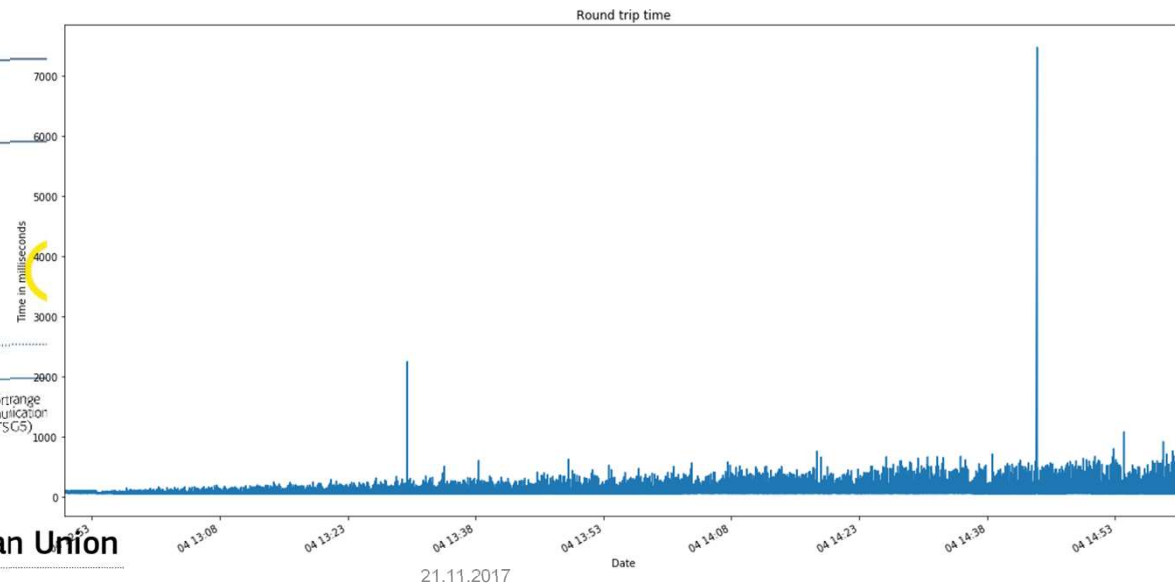
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Latency in the Interchange Node



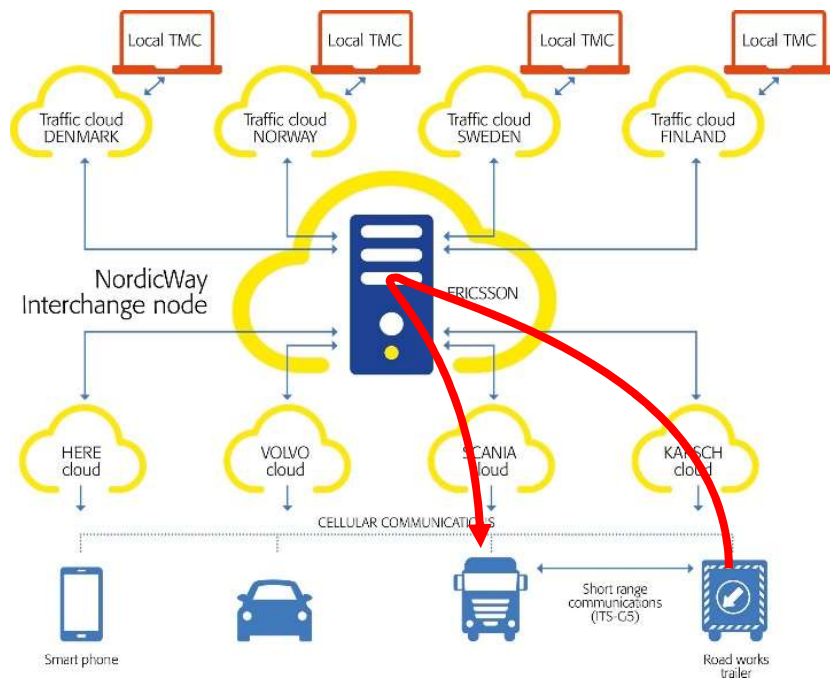
- For 130000 msg
 - Median 56 ms
 - Avg 60 ms

Very small delay, mainly due to internet transport between servers in different countries



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End-to-end Latency for the Roadworks pilot

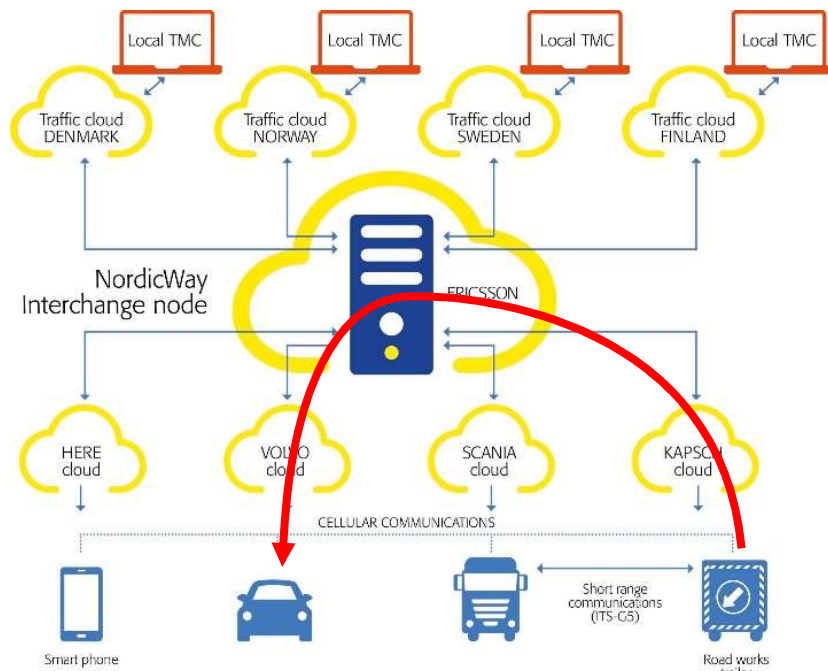


- Roadworks - Scania cloud
 - Driving study (Södertälje)
 - Median 2.1 s (avg 4.9 s)
 - Controlled tests
 - Median 1.1 s (avg 1.2 s)

- Roadworks – Scania vehicle
 - Driving study (Södertälje)
 - Median 2.5 s (avg 11.3 s)
 - Controlled tests
 - Median 1.3 s (avg 1.4 s)

- Message success rate: 100%

End-to-end Latency for the Roadworks pilot

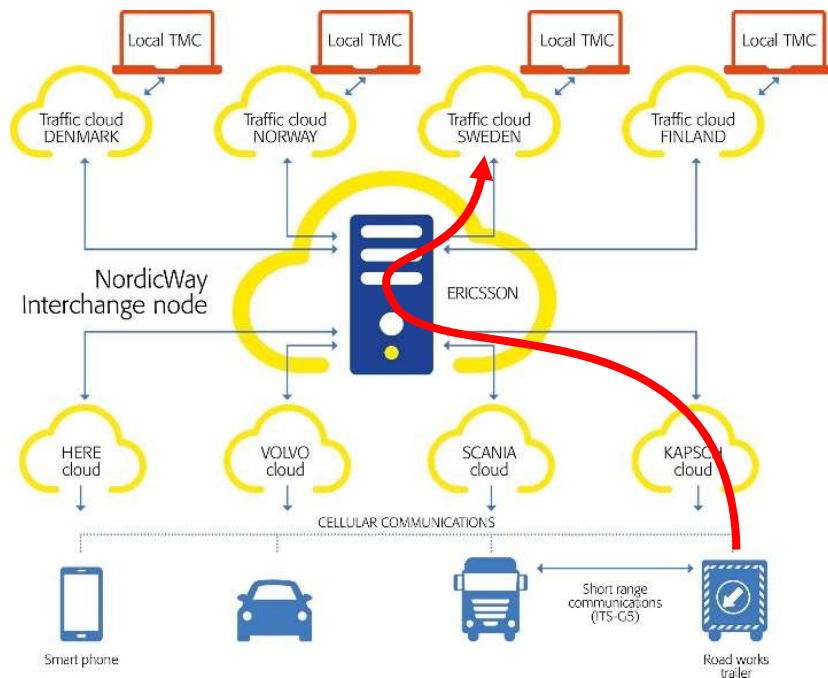


- Roadworks - Volvo cloud
 - Controlled tests
 - Median 0.9 s (avg 0.9 s)
- Roadworks – Volvo vehicle
 - Including time to send an acknowledgement back from vehicle to Volvo cloud
 - Driving study (Södertälje)
 - Median 2.5 s (avg 11.3 s)
 - Controlled tests
 - Median 1.3 s (avg 1.4 s)



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End-to-end Latency for the Roadworks pilot



- Roadworks – Traffic Cloud
 - Median 1.1 s (avg 1.6 s)



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Conclusions



- Very small latencies in the order of 0.3-2 seconds obtained
 - Latency depends on mobile network version (3G, 4G)
- High reliability

- Delays caused by:
 - Problems in the mobile communication network
 - Problems with the servers
 - Current version of Interchange Node is a prototype

