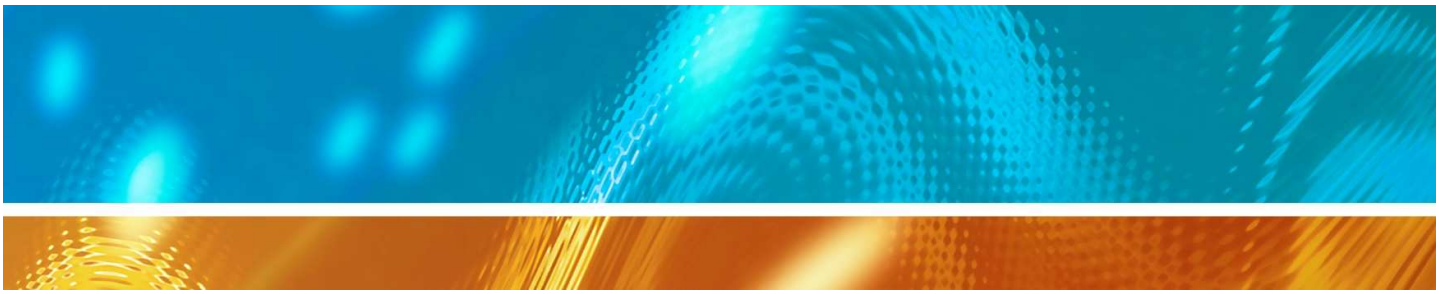
VAISALA

TRAFFIC WEATHER DSS SYSTEM FRAMEWORK



Report

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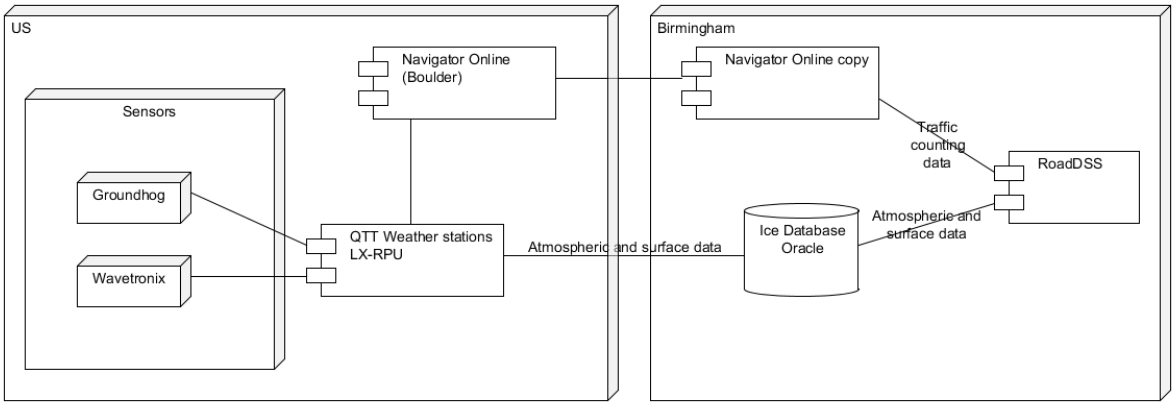
Traffic Weather DSS System Framework

This document explains the Traffic Weather DSS System Framework which was investigated during the MMEA Program. The MMEA deliverable reference number is 1.2.19.

1 Background

The Vaisala RoadDSS Winter Maintenance Decision Support System ingests observation and forecast data from several sources, stores data, and display data to end-users via a Web User Interface. One source of observation data is Traffic Counting data, that is, how many vehicles have passed a measurement point on the road network, what has been their average speed, or what has been the length of those vehicles. Some Traffic Counting sensors can also provide binned data, which indicates how many vehicles have been travelling at different speeds. The RoadDSS system needs to be able to collect, store, and display the above mentioned data.

The overall system at the time was divided to two locations: United States and United Kingdom, and divided to two applications: Navigator Online (legacy) and RoadDSS.



2 Implementation options

During the investigation different implementation options were reviewed.

Option 1: Only atmospheric and surface data in Oracle; All traffic counting data in Navigator Online's database.

Option 2: Also put "simple" traffic counting data to Oracle, such as average speed, number of vehicles. Only the bin data would be read from Navigator Online's database.

2.1 Separate Traffic Counting data

Need to change data access routines for RoadDSS station summary, map, single station view, graph, and excel report. The data access routines will be slower because data has to be fetched from two databases and merged together.

2.2 Have some Traffic Counting data in the weather database

Current queries work without modification.

Traffic counting data interval is different from meteorological data interval. This will cause difficulties also with Option 1, but with Option 2 the only solution is to "force" the data intervals to be the same.

It would be possible to use existing Quality Control system, called Sensor Monitoring.

3 Issues

The following issues were identified as part of the investigation:

- Scaling issues
- Database linking
- Quality control
- License costs

3.1 Scaling issues

The following scaling issues were identified:

- Navigator Online has 115 GB of data after 20 months
- Groundhog data interval is 5 minutes (up to 16 bins)
- Most customers would like to keep the data forever

3.2 Database linking

Linking stations between Navigator Online and Oracle would need to be solved somehow. It would be possible to create a new station property in Oracle that gives the Navigator Online id.

3.3 Quality control

Quality control is missing from the system architecture. If traffic counting data would go to Oracle, it would be possible to use Sensor Monitoring for Quality Control.

3.4 License costs

Using Microsoft SQL Server (Navigator Online) would incur additional license costs. It was investigated would it be possible to use any other database for Navigator Online, but that was concluded to be too challenging with the time frame.