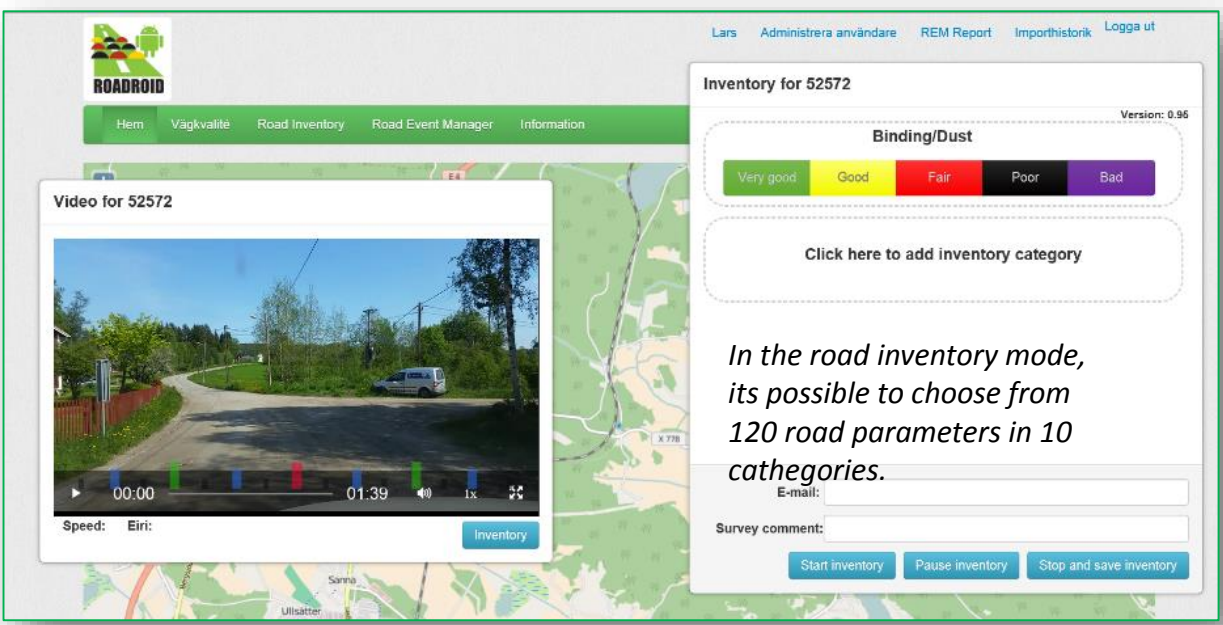


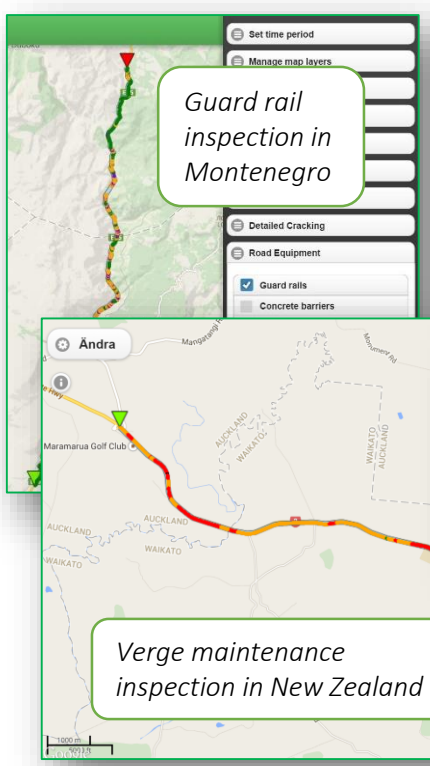
GPS-video and visual road inventories

- Important to mount phone with camera lens unobstructed (clear view).
- Video quality is HD 720p and 30 FPS - with or without sound.
- While playing video - a marker is moving on map to show location.



In the road inventory mode, its possible to choose from 120 road parameters in 10 cathegories.

Result from the visual road inventory is saved back to the system and can be viewed in a road inventory view. This view have the possibility to plot the result on the map background – and you can also extract in preferred segment lengths for import in your assets management system.



Guard rail inspection in Montenegro

Verge maintenance inspection in New Zealand

The Roadroid offer:
 Two months free evaluation period
 Pricing is after evaluation is dependent on:
 - How many units/phones you will use
 - How long time you bind/commit to use them.
 Free to use for universities in research and training!

Contact:
 Lars Forslof:
 Email: lars.forslof@roadroid.com
 Cell phone: +46-722426620
 LinkedIn: <https://se.linkedin.com/in/lforslof>

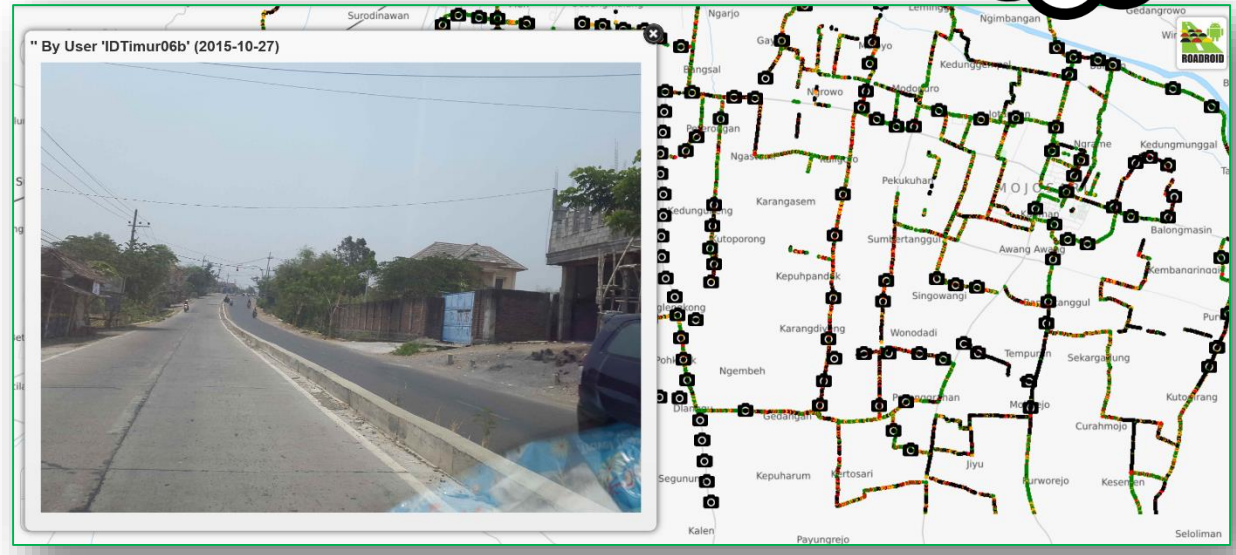
Roadroid

- Smartphone app for Road Surveys
- Road Data Management System



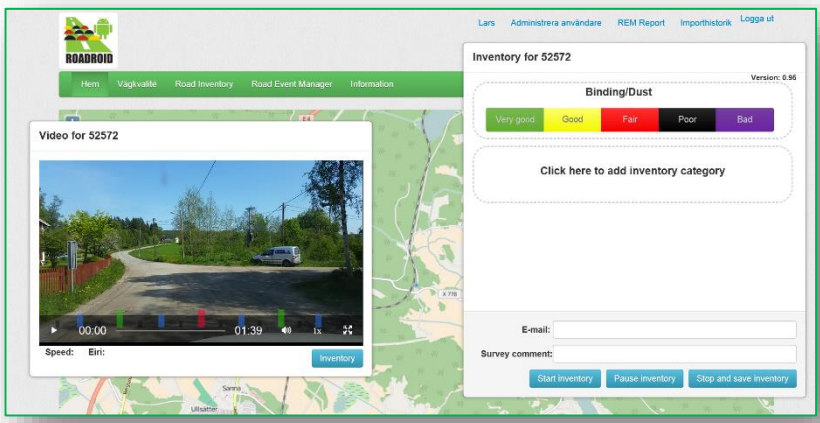
App measures vibrations with internal accelerometer and capture photos/videos with GPS.coordinates.

Data is uploaded to a cloud service after survey, when you have a connection.



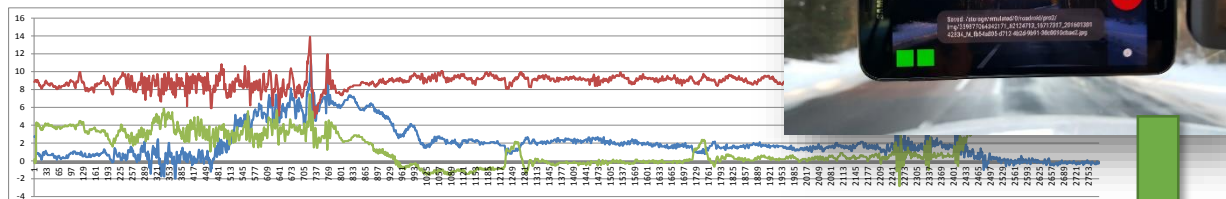
- Road Data Management System:**
- Show survey data on map
 - Show photos/videos on map
 - Extract data in sections to plot charts in MS Excel.
 - Extract data to Shape/KML format for use in GIS-tools.

From the GPS videos, you can make visual Road Inventories.



Smart phone app for road surveys

- Analyse car body vibrations in 100-200 Hz
- Calculates two IRI values and GPS-data



Possible settings

- Three car types (Small car - Medium/large – 4WD typ Hilux)
- Phone type - adjusts the sensitivity for an estimated IRI (eIRI)
- Sensitivity and segment length for a calculated IRI (cIRI)

Accuracy

Roadroid is a response type survey system. It is according to the world banks Information Quality Level 3 (IQL3). A laser survey vehicle is IQL1. IQL3 gives about 80% accuracy in comparison to IQL1.

You can calibrate the system to an known IRI for a section!

Its possible to get correlation R2 up to 0,8 - with correct tuning and speed.

Survey speed is important for a good correlation. The best correlation to IRI is achieved in 70-80 km/h. Two IRI values are calculated:

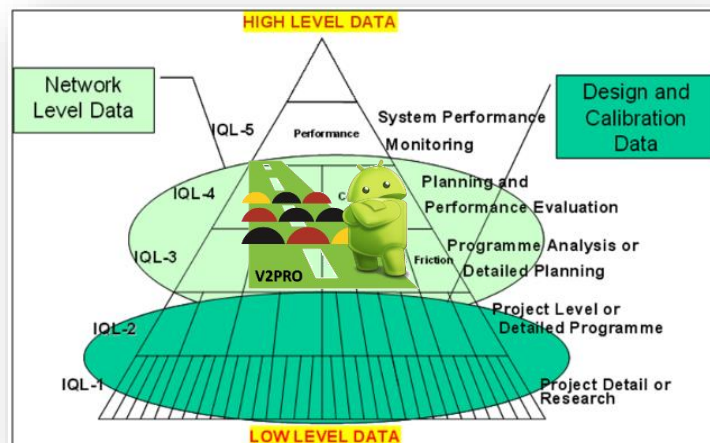
Estimated IRI

- linear formula with a new calculation each second
- have a speed compensator for paved roads
- is sensitive for rough macro textures
- is calculated from the quarter car formula

Calculated IRI

- sensitivity need to be set for a certain vehicle and survey speed
- calculates vertical changes over a length and use a smoothing filter
- calculation segment lengt can be set from 20 m - 200 m, depending on type of roads and lenght of sections.

IMPORTANT: Collect data to the appropriate level of decision you are making!



Road Data Management System (RDMS)

- Data is uploaded to internet where you have a good connection
- Survey data is small size and can easily be uploaded with 3G/4G
- Photo/Video files are large and should be uploaded on a good WiFi
- The RDMS have a user account with certain units (IMEIs) connected to it
- Each start/stop in app is imported as a survey file to the system

Import History List

Show 25 entries

Import date	User Name	Unit Name	File Name	Import Status	Measurement Length (m)	
11/7/2014 1:00:37 AM	FultonhoganNZ01	FultonHogan01	353314056222589-20141107112700-b517dab7.zip	Import OK	5541	Details
11/7/2014 1:00:34 AM	FultonhoganNZ01	FultonHogan01	353314056222589-20141107110206-f226b16c.zip	Import OK	4030	Details
11/7/2014 1:00:31 AM	FultonhoganNZ01	FultonHogan01	353314056222589-20141107105638-662436ed.zip	Import OK	2363	Details
11/7/2014 1:00:29 AM	FultonhoganNZ01	FultonHogan01	353314056222589-20141107105256-29d51378.zip	Import OK	3546	Details
11/7/2014 1:00:26 AM	FultonhoganNZ01	FultonHogan01	353314056222589-20141107103150-977383b4.zip			
11/7/2014 1:00:24 AM	FultonhoganNZ01	FultonHogan01	353314056222589-20141107101602-18231aa9.zip			
11/7/2014 1:00:24 AM	FultonhoganNZ01	FultonHogan01	353314056222589-20141107101131-9fd3c1e.zip			

From the import history it is possible to

- View survey file details
- Show the specific survey on map
- Export Shape or KML files
- Aggregate survey in preferred section lengths

353314056222589-20141107110206-f226b16c_aggr - Anteckning

Date/Time	Latitude	Longitude	Distance(m)	Speed (km/h)	Altitude (m)	eIRI	cIRI
11/7/2014 11:02:06 AM	-43.832506	171.521805	100	57.11	223.25	1.48	2.55
11/7/2014 11:02:12 AM	-43.8330599554872	171.520635505559	171.520635505559	200	58	223.5	1.38
11/7/2014 11:02:18 AM	-43.8335138341254	171.519667736153	171.519667736153	300	58.65	223.7	1.23
11/7/2014 11:02:24 AM	-43.8339903851809	171.518659112232	400	58.36	224.12	1.21	1.93
11/7/2014 11:02:30 AM	-43.8344563869025	171.517652802832	500	57.88	223.83	1.26	1.83
11/7/2014 11:02:36 AM	-43.8349337908112	171.516638179411	600	58.46	223.57	1.16	1.82
11/7/2014 11:02:42 AM	-43.8354874508892	171.515630797497	700	58.56	223.76	1.28	2.02
11/7/2014 11:02:48 AM	-43.8358789852149	171.514633402131	800	58.04	224.1	1.27	2.19
11/7/2014 11:02:54 AM	-43.8363530272048	171.513632673648	900	58.66	224.58	1.88	3.9
11/7/2014 11:03:01 AM	-43.836983169688	171.512293513941	1000	58.88	224.84	1.83	3.51
11/7/2014 11:03:07 AM	-43.8374561001199	171.511293925997	1100	58.78	224.83	1.44	3.01
11/7/2014 11:03:13 AM	-43.8379271498475	171.510286831898	1200	58.38	224.5	1.4	2.98
11/7/2014 11:03:19 AM	-43.8383944206109	171.509292843521	1300	58.43	224.66	1.46	2.26
11/7/2014 11:03:25 AM	-43.8388671931476	171.508280609829	1400	58.99	224.62	1.35	2.68
11/7/2014 11:03:31 AM	-43.8393434824963	171.507259639816	1500	58.83	224.51	1.83	2.92

Roughness and survey speed can be shown in different layers on the map.

The system is easy to use and illustrative!

