

Ruter#

Supplier Conference Jan, 14th 2016

Passenger Counting Solutions

The Efficient Collection of Ridership Data

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Key Account Manager Nordic Countries

init

Agenda

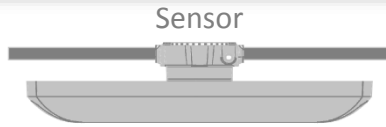
The Technology

- IRMA-Matrix Passenger Counting Sensor
- APC System Concept

Focus areas APC

- Important considerations for a Future Oriented Passenger Counting System
- How can Ruter utilize Counting Data as a Customer Information Element?

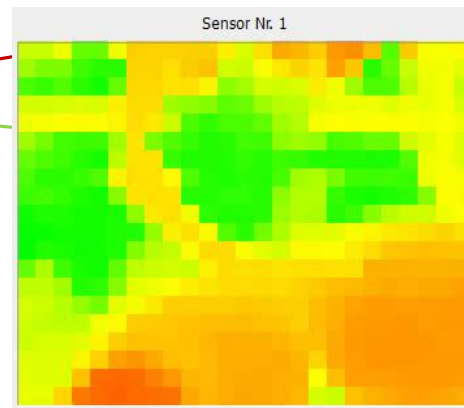
IRMA-MATRIX Passenger Counting Sensor. (Time of Flight Technology)



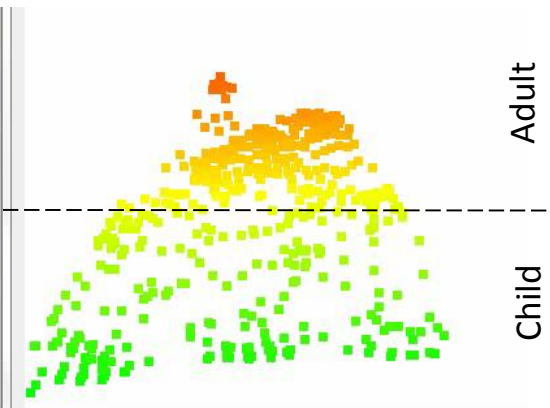
IRMA MATRIX



Birds-Eye-View



Side View



System Concept IRMA MATRIX



5 Rintheim
S4 Heilbronn
6 Daxlanden
Von Freitag, 02. Juli

in 2 min
in 3 min
in 5 min



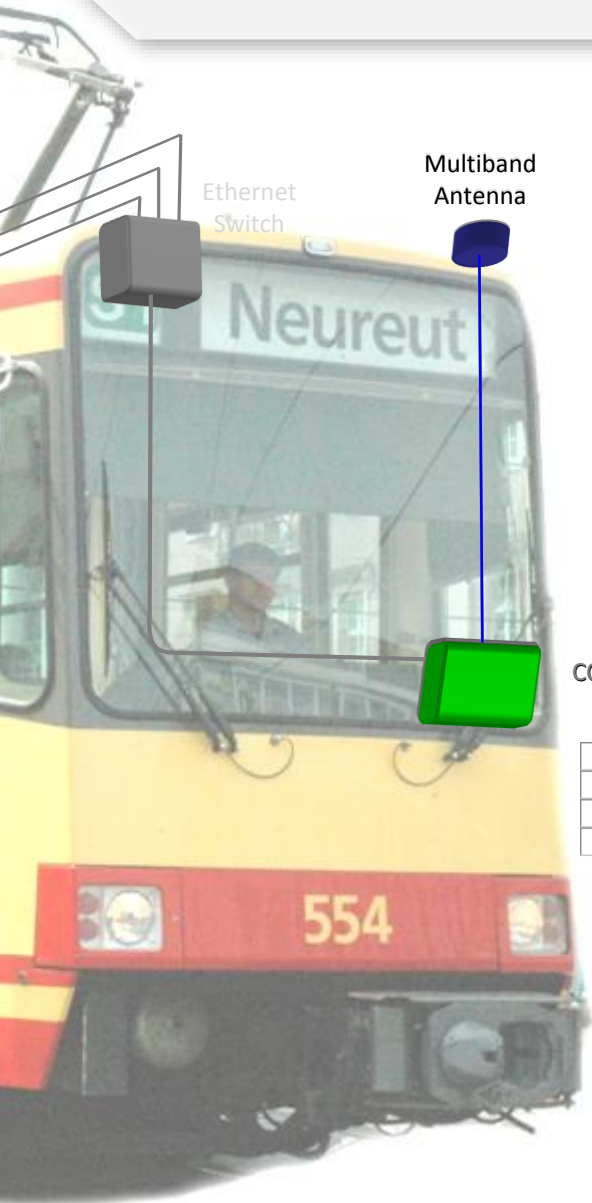
S1 S11 S4 S41 121

S1 Neureut

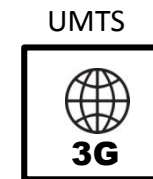
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Recording and Transmitting of Data



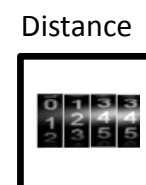
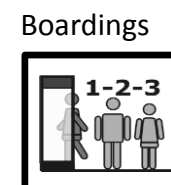
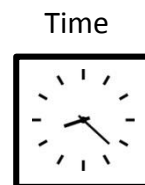
Transmitting to the Central Side



COPILOTpc

Vehicle Telegram

2426	2	Cyclic - Telegram with GPS	Longitude: 13.864638333333334Latitude: 50.97208166666667	<input checked="" type="checkbox"/>	24:01:2007	08:08:22	77427
2427	2	Cyclic - Telegram with GPS	Longitude: 13.864948333333333Latitude: 50.97195333333333	<input checked="" type="checkbox"/>	24:01:2007	08:08:27	77453
2428	9	Passenger - Telegram	Door: 1 Board: 2 Alight: 0	<input checked="" type="checkbox"/>	24:01:2007	08:08:28	77460
2429	9	Passenger - Telegram	Door: 2 Board: 0 Alight: 0	<input checked="" type="checkbox"/>	24:01:2007	08:08:28	77460



Important Considerations for a Future Oriented Automatic Passenger Counting System



Flush Mount



Surface Mount



Scalability => Various Interfaces to third Party Systems

ISI Interface (ethernet) , IBIS Wagonbus, CAN Bus



No External Light Source needed

Unlike conventional video technology, the sensor does not require an external light source



Low Installation Effort / Maintenance Free

No adjustment work needed, only 1 sensor per standard door

No analyzer unit needed => Sensor delivers counts directly upon request from On Board unit



No door contact required => Low Maintenance Costs

Sensor receives door release signal from On-Board-Unit for activation



Detection of height profiles

Distinction between adults and children for accurate revenue distribution and better planning



Highest accuracy (98% guaranteed)

Distinction between Passengers and objects also in bulk entries

Detection of wide entry doors => Master / Slave Sensor

Usage of Passenger Numbers

Information Flow of the Vehicle Load

Vehicle Fleet



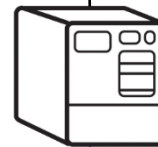
Automatic Calculation of Vehicle Load

Central - Side



Dispatcher

Realtime



Realtime

(Not Realtime)



Management
Performance (KPI)



Statistics
Planning

Customer

Smartphone Apps



Mobile
On Board Displays

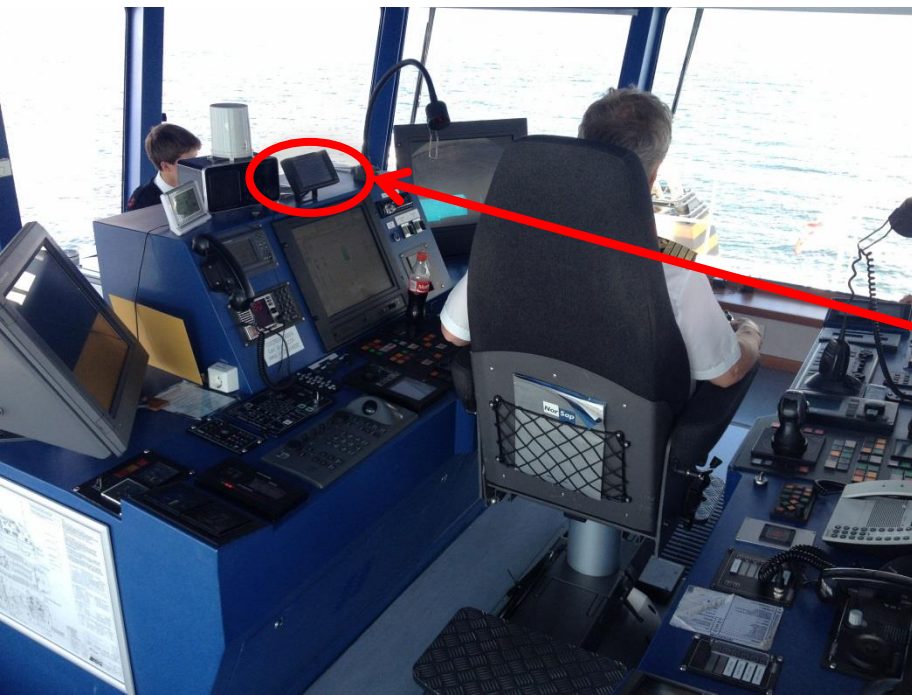


Stationary
Passenger Displays



Information for the Captain

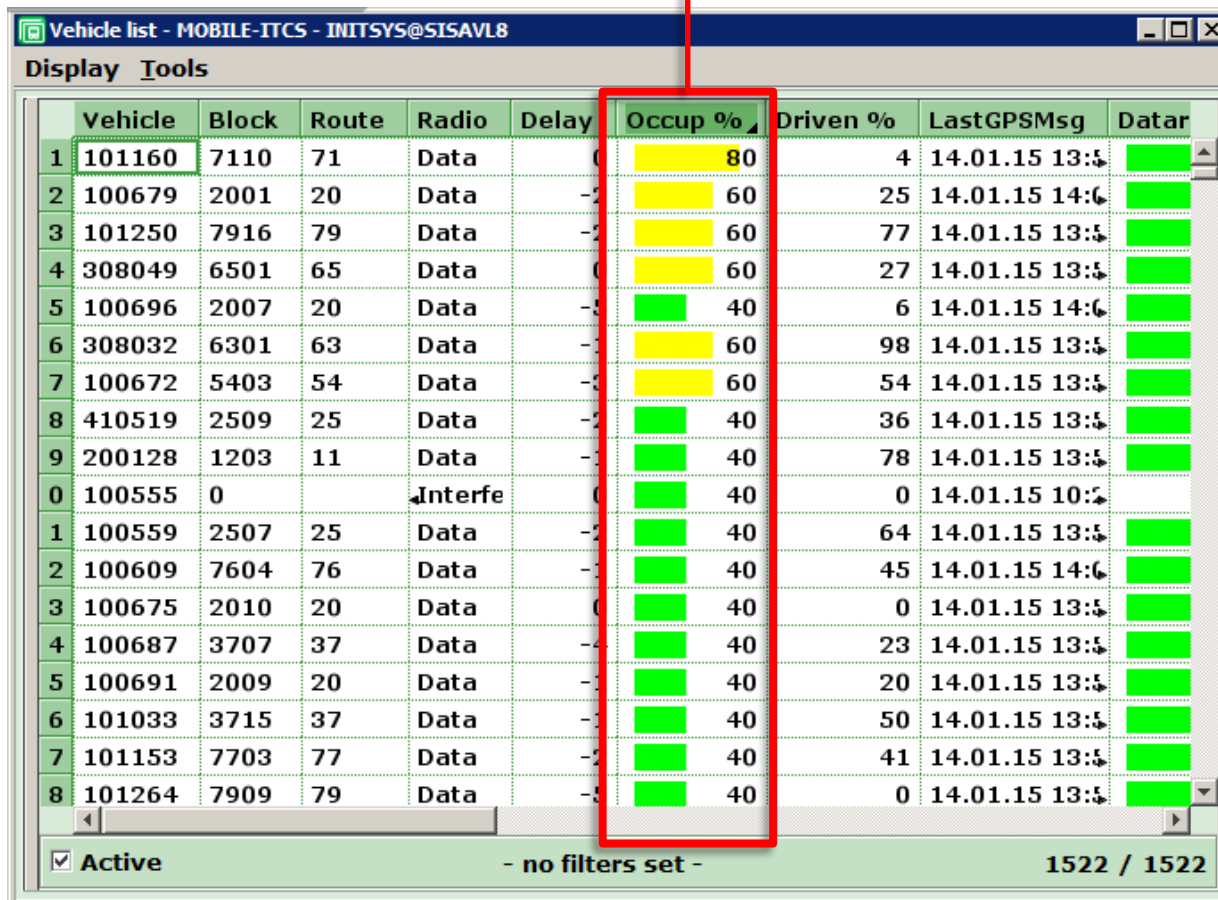
Passenger Load on Board the Ferries (Security Aspects)



Information for the Dispatcher

Real Time Vehicle Load (ITCS-System)

Vehicle Occupancy Level (Percentage)



Vehicle list - MOBILE-ITCS - INITSYS@SISAVL8

Display Tools

	Vehicle	Block	Route	Radio	Delay	Occup %	Driven %	LastGPSMsg	Datar
1	101160	7110	71	Data		80	4	14.01.15 13:5	
2	100679	2001	20	Data	-2	60	25	14.01.15 14:6	
3	101250	7916	79	Data	-2	60	77	14.01.15 13:5	
4	308049	6501	65	Data	0	60	27	14.01.15 13:5	
5	100696	2007	20	Data	-2	40	6	14.01.15 14:6	
6	308032	6301	63	Data	-2	60	98	14.01.15 13:5	
7	100672	5403	54	Data	-2	60	54	14.01.15 13:5	
8	410519	2509	25	Data	-2	40	36	14.01.15 13:5	
9	200128	1203	11	Data	-2	40	78	14.01.15 13:5	
0	100555	0		Interfe	0	40	0	14.01.15 10:5	
1	100559	2507	25	Data	-2	40	64	14.01.15 13:5	
2	100609	7604	76	Data	-2	40	45	14.01.15 14:6	
3	100675	2010	20	Data	0	40	0	14.01.15 13:5	
4	100687	3707	37	Data	-4	40	23	14.01.15 13:5	
5	100691	2009	20	Data	-2	40	20	14.01.15 13:5	
6	101033	3715	37	Data	-2	40	50	14.01.15 13:5	
7	101153	7703	77	Data	-2	40	41	14.01.15 13:5	
8	101264	7909	79	Data	-2	40	0	14.01.15 13:5	

Active - no filters set - 1522 / 1522

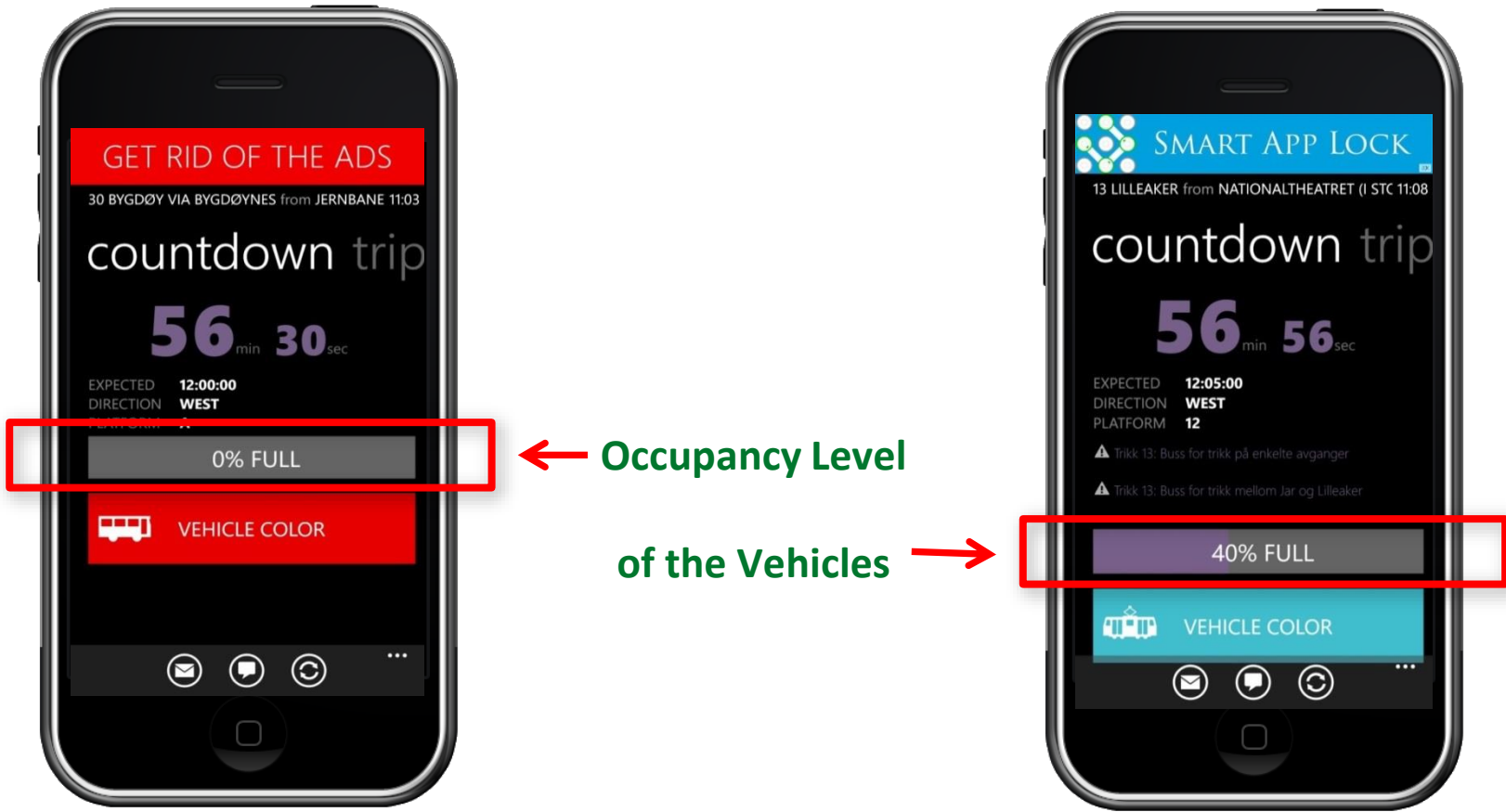
Information for the Management

MOBILE Dash (Key Performance Indicators)



Information for the Passenger

Smart Phone App showing the current vehicle load



Passenger Information

On Board Displays / Way Side Displays

Informed Customers are Happy Customers



**On Board Displays
(Vehicle Load of Connecting Trips)**



**Stationary Displays
(Vehicle Load of Arriving Bus / Tram)**

Weather Related Ridership Analysis

Analyzing what causes Fluctuations

When?

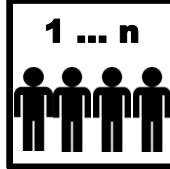
December

MO 1st

What time?



How many?



Where?

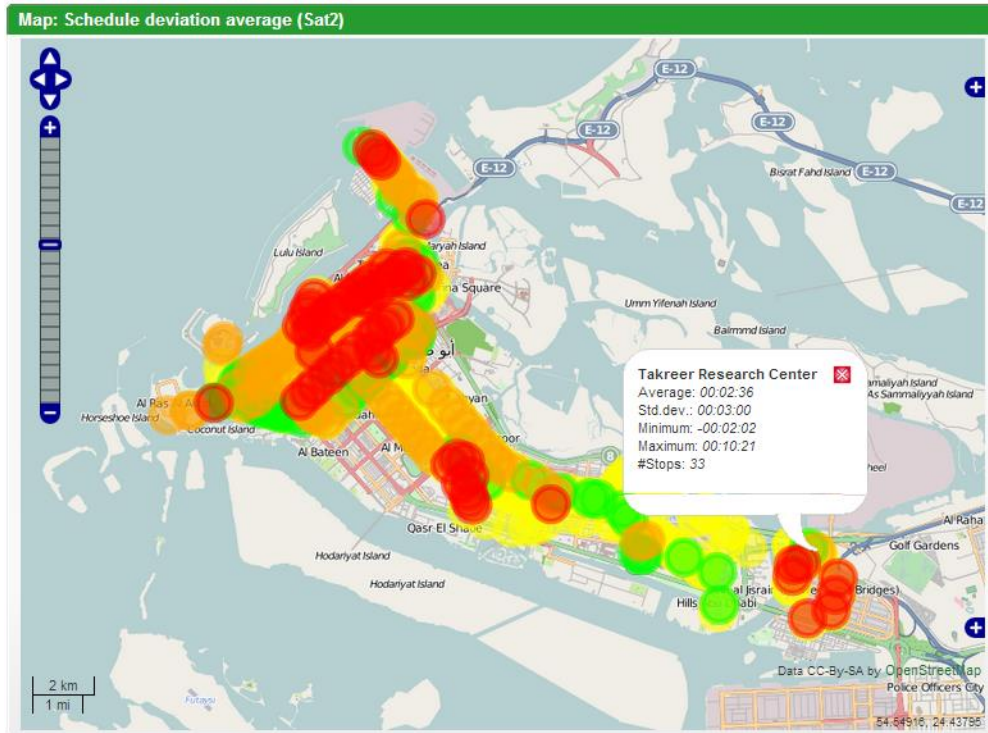
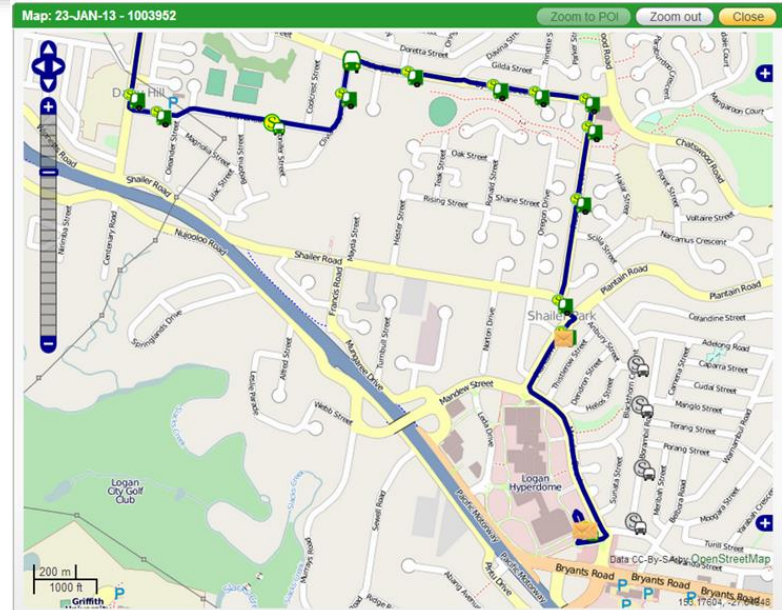
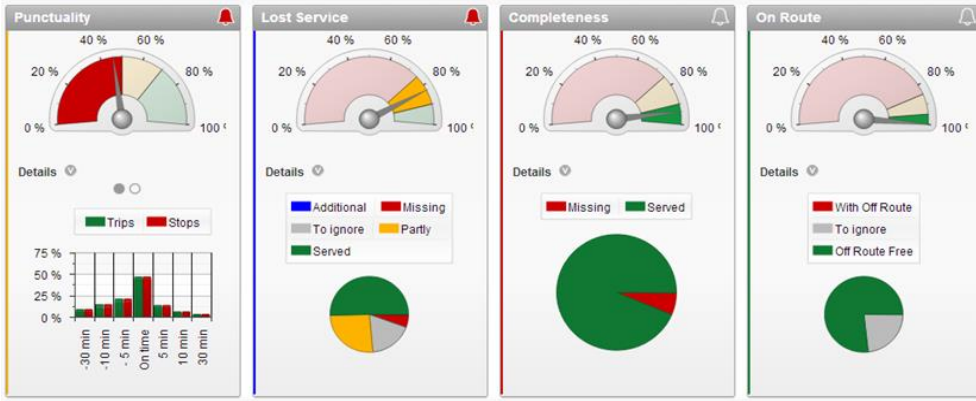
GPS

How?



Information for the Planner

WEB-Based Statistics



Thank you for your Attention

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