

SWISS TRAFFIC




Traffic Performance
and Crowd Control

Traffic Performance & Crowd Control

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**WHERE TRAFFIC AND PEOPLE COME
WE CAN DO THE ANALYTICS !**

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ABOUT SWISSTRAFFIC

SWISSTRAFFIC is a planning and consulting firm operating internationally in the fields of mobility, road safety and signalisation. Since 2008, SWISSTRAFFIC is, furthermore, working within the topic of smart city – smart mobility, and of late also in the internet of things – Mobility 4.0.

BlueScan® improves performance of real estate, shop, mall, public roads, train stations and airports. Supplying Valuable 24/7 insights, like window conversion, waiting time, new visitors, loyal visitors, shop-time, travel time, staff efficiency, all very exciting new Key Performance Indicators.

BlueScan® locates, tracks and translates these signals into real-time information on public flows. This makes BlueScan® a relatively inexpensive and reliable add-on to the more traditional measuring systems, like infrared counting, thermal imaging cameras, license plate recognition cameras, manual counting and interviewing.

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TRAFFIC PERFORMANCE



- **Travel time measurement between any locations**
- **Traffic density estimation**
- **Traffic jam detection**
- **Data available 24/7**
- **1 unit, up to 10 driving lanes**
- **0-500 meters' area**
- **In-car device detection**
- **8 microseconds scanning**
- **Special antennas to deliver optimal results**
- **Easy installation**
- **Fully anonymous, no privacy concerns**

WHY BLUESCAN® WORKS?

BlueScan® is an effective and economical measuring instrument for analysing road traffic. From pedestrians, bicycles, motorcycles to cars and trucks.



WHAT IS POSSIBLE?

- With BlueScan® a lot of complex questions get answered in a simple and efficient way.
- “What is the travel time from A-B?”, “Can I advise routes via Digital Roadside Signage?”, “Are there traffic jams on this route?”, “How much stopping time at these traffic lights”, “Is the green flow traffic light system working?”, “What is the flow of vehicles on this roundabout?” All these questions are easily answered in using BlueScan® with a reliability of 98%.
- Temporary traffic assignments generally use smaller and random samples. Permanent traffic measurement is mostly done with ANPR (license plate recognition) which is very expensive and per-lane based.
- With BlueScan® you can perform 24/7 measurement at very low cost.

HOW DOES IT WORK?

- A constant number (ratio) of vehicles have a Bluetooth or Wi-Fi signal switched on. Devices can be handset, car kit, navigational systems, parrot, headsets. This provides a good basis for carrying out traffic measurement.

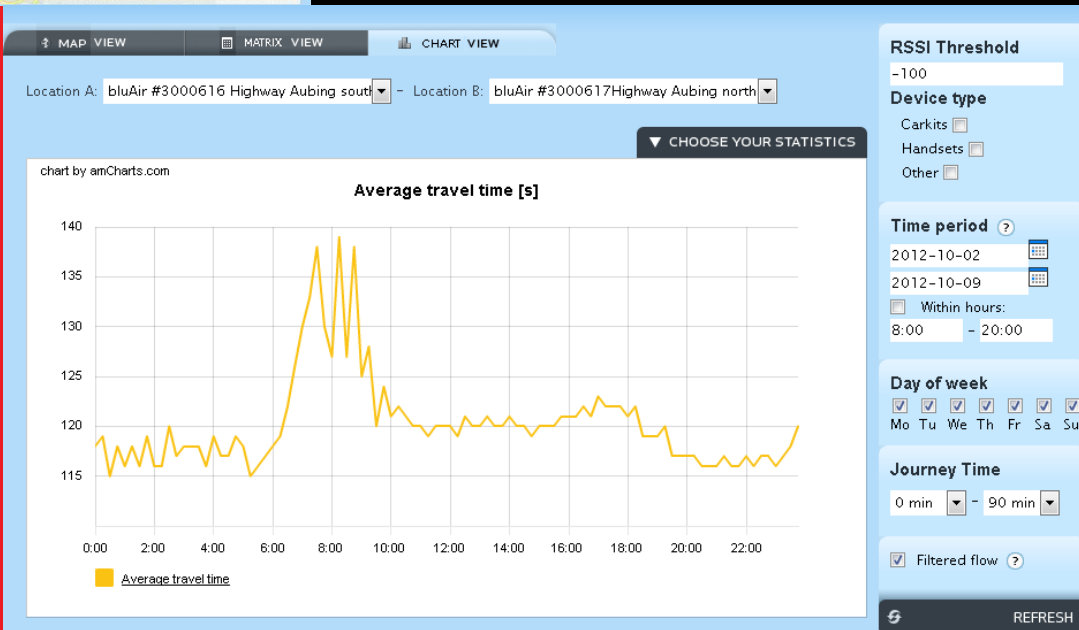
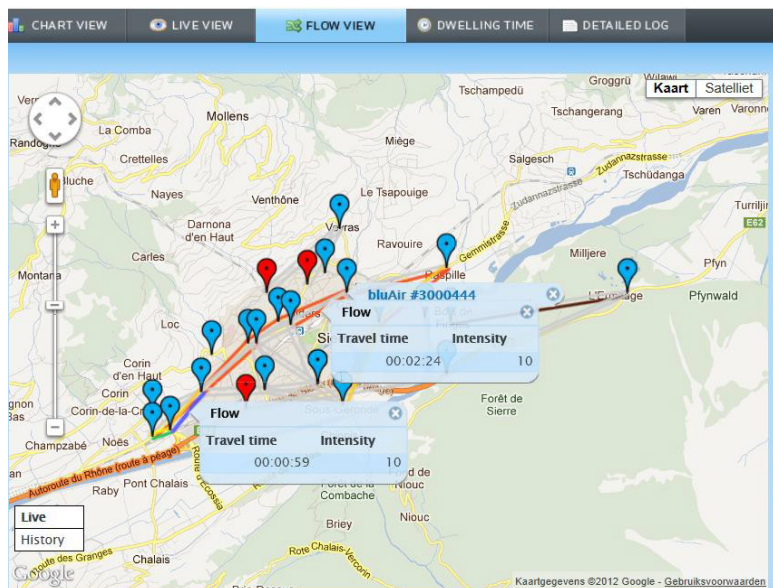
WHAT REPORTS ARE AVAILABLE?

- Dataset of in-car devices, Dataset of all devices
- Live view of number of vehicles (based on ratio), pedestrians
- Live calculation of travel time and flow between units, per hour
- Live calculation of dwelling time per unit, per hour
- Off-line analysis of business rule sets, example, how is traffic divided on a roundabout

WHAT CUSTOM REPORTS ARE AVAILABLE?

- Live view of travel time between A-B and B-A.
- API for connecting to digital signage.

SAMPLE REPORTS



bluAir #3000614	bluAir #3000616	bluAir #3000617	bluAir #3000618	bluAir #3000619	bluAir #3000620
479	--	--	109	--	--
--	--	--	--	--	--
--	490	1123	--	--	--
--	967	942	--	2942	--
283	--	--	337	--	--
--	--	2811	--	920	--
--	--	951	677	--	--
--	--	--	--	6241	--
--	--	606	--	--	--
161	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
329	--	--	--	--	--



TECHNICAL SPECIFICATION **FACTSHEET**

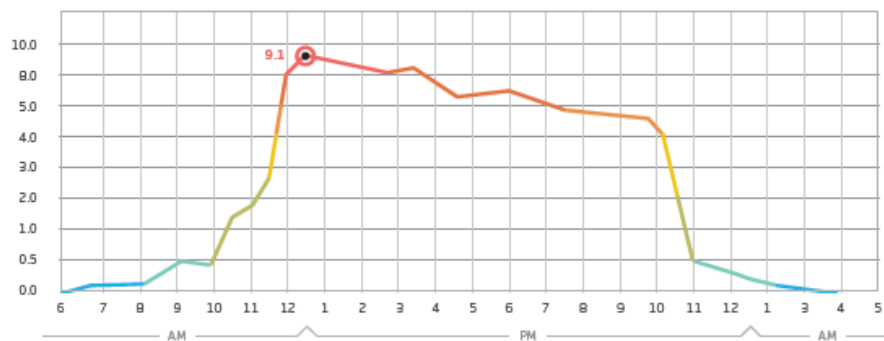
BLUETOOTH /WIFI ANTENNAS	Class 1 (100-500 meters) / Bluetooth 2.0+EDR (3 Mbps) / Sensitivity -82dBm / Antenna options: 6 degrees, 60 degrees, 120 degrees, 360 degrees
MEASUREMENT AREA	Fully adjustable / Full sampling (continuous scanning: 8 usec) RSSI signal filter / Different antenna's
BLUESCAN® SERVER	Quad core optimised for large data streaming fast sampling of Bluetooth radio's
DATABASE	'raw' logging (full sampling) available through XML/API / XML/API: query per unit or all units, per minute, or period (max. 1000 records)
DATASET	Timestamp / Mac address / RSSI / Device type
CPU	1 GHz
RAM	256 MB
MEMORY STORAGE	1 GB Power-off proof (can be upgraded up to 4GB)
POWER REQUIREMENTS	110/220-240V converted to 5V @ 2A
OPERATING TEMPERATURE	-18°C to +60°C (0°F to 140°F)
STORAGE TEMPERATURE	-40°C to +70°C (-40°F to 160°F)
HUMIDITY	0-90%
NETWORK INTERFACES ETHERNET	Ethernet / Wi-Fi / GPRS/3G/HSDPA (option)
I/O	RJ-45 Ethernet Connector / External 6-pin Mini DIN for PS2
OPERATING SYSTEM	Linux
INTEGRATION WITH EXTERNAL SYSTEMS	Customers are free to install their own software. API integration via BlueScan® web platform is possible.
CASING	Outdoor small, large battery casing

CROWD MANAGEMENT



- How many visitors attend the event?
- Which are the busiest locations?
- Which are the most common routes visitors take?
- What is the people density per square meter?
(Is it growing? Should security be alerted?)

CROWD DENSITY OVER TIME (per sqm)



WHY CROWD MANAGEMENT WORKS?

BlueScan® crowd management provides real-time information on the number of people per square meter and the movements of large groups of people. This allows BlueScan® to support in taking the right decisions.



WHAT IS POSSIBLE?

- With BlueScan® a lot of complex questions get answered in a simple and efficient way.
- “Do we need to close off access to this market square in the next 15 minutes?”,
 “Is it still save to have people entering areas? “,
 “Are there 2, 3 or 4 people/square meter?”,
 “What is the walking time from A-B?”,
 “Can I advise routes via digital signage?”,
 “How many people are arriving per car or train?”,
 “Can we send security or police home, commence downscaling?”,
 “Which route did people walk?”,
 “Did my signage work for crowd management?”.
- All these questions are easily answered in using BlueScan® with a reliability of 95%.
- Manual counting is almost undoable and will never create a live total view of crowd density.
- Using a helicopter or helium balloon is very expensive and limited in usage, noise, limited view.
- With BlueScan® you can perform 24/7 measurement of crowds at very low cost.

HOW DOES IT WORK?

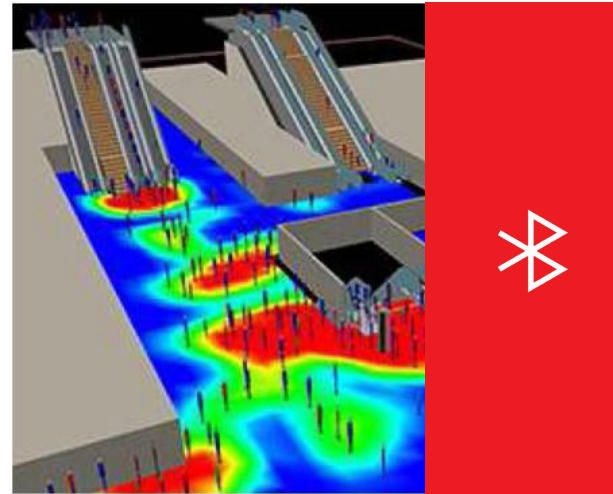
- A constant number (ratio) of people have their Bluetooth or WIFI signal switched on as standard. This ratio is determined live on site and provides a good basis for carrying out crowd measurement.
- The ratio is determined to make sure we reach the reliability of 95%
 - Trough manual reference counting
 - Through pressure pads
 - Through infrared counting

WHAT REPORTS ARE AVAILABLE?

- Live view of number of people (based on ratio)
- Live view of crowd density (people/sq. meter) (based on ratio)
- Live calculation of walking time and flow between units, per hour
- Live calculation of dwelling time per unit, per hour
- Offline analysis of business rule sets, example, how crowd is divided on a roundabout.

WHAT CUSTOM REPORTS ARE AVAILABLE?

- Live view of walking time between A-B and B-A.
- API for connecting to digital signage.



CROWD CONTROL

BlueScan® Crowd Control provides real-time answers and this allows effectively to support police or security services in taking the safe but also cost-effective decisions.

WHAT IS POSSIBLE?

- Unique person identification (by Bluetooth- enabled or WIFI enabled mobile phone, but without privacy concerns)
- 24/7 Live Data accessed via BlueScan® web platform
- Installation is easy and inexpensive



SOFTWARE FEATURES

- Map-based live view
- Map-based history view
- Chart view
- Flow view
- Custom reporting
- API Integration with external systems



TECHNICAL SPECIFICATION **FACTSHEET**

BLUETOOTH /WIFI ANTENNAS	Class 1 (100-500 meters) / Bluetooth 2.0+EDR (3 Mbps) / 802.11B, G, A, N / Wi-Fi radio 100 mWatt or 200 mWatt / Sensitivity -82dBm / Antenna options: 6 degrees, 60 degrees, 120 degrees, 360 degrees
MEASUREMENT AREA	Fully adjustable / Full sampling (continuous scanning: 8 usec) / RSSI signal filter Different antenna's
BLUESCAN® SERVER	Quad core / Optimised for large data streaming / Fast sampling of Bluetooth radio's
DATABASE	'raw' logging (full sampling) available through XML API/XML / API: query per unit or all units, per minute, or period (max. 1000 records)
DATASET	Timestamp, Mac address, RSSI, device type
CPU	1 GHz
RAM	256 MB
MEMORY STORAGE	1 GB Power-off proof (can be upgraded up to 4GB)
POWER REQUIREMENTS	110/220-240V converted to 5V @ 2A
OPERATING TEMPERATURE	-18°C to +60°C (0°F to 140°F)
STORAGE TEMPERATURE	-40°C to +70°C (-40°F to 160°F)
HUMIDITY	0-90%
NETWORK INTERFACES ETHERNET	Ethernet, Wi-Fi, GPRS/3G/HSDPA (option)
I/O	RJ-45 Ethernet Connector External 6-pin Mini DIN for PS2
OPERATING SYSTEM	Linux
INTEGRATION WITH EXTERNAL SYSTEMS	Customers are free to install their own software. API integration via BlueScan® web platform is possible.
CASING	Industrial grade outdoor case. Battery casing White label Rebranded (10+ units)

DATA PRIVACY **ASSURANCE** AND SECURITY OVERVIEW

DATA ITEM	DESCRIPTION	UNIQUENESS LEVEL	PROCEDURES APPLYING	CAN BE TRACKED DOWN TO IMEI, OR PHONE (OR SUBSCRIPTION) NUMBER?
Wireless Handset Bluetooth MAC Address	Unique identifier assigned to Bluetooth interface communication.	Unique per wireless handset	Client-side encryption (optional) Server-side encryption (optional)	No
Wireless Handset Wi-Fi MAC Address	Unique identifier assigned to Wi-Fi interface communication.	Unique per wireless handset	Client-side encryption (optional) Server-side encryption (optional)	No
Bluetooth Device Class	Description of the Bluetooth device. Describes the high-level capabilities of the device, including information on networking, positioning, rendering, capturing, object transfer, audio capabilities, telephony capabilities, information access.	Non-unique	N/A	No

DATA GATHERING PROCESS

PHASE	PROCESS	DESCRIPTION	DATA AVAILABILITY
1	Wireless data collection	BlueScan® hardware devices are gathering information about Bluetooth- and/or Wi-Fi-enabled devices, specifically: <ul style="list-style-type: none"> • Bluetooth MAC • Bluetooth Device Class • Wi-Fi MAC 	Data in RAM, and/or in swap files, not stored
2	Client-side encryption (optional)	Data is hashed with randomly generated key (which is changed daily, or weekly, depending on user settings)	Data in RAM, and/or in swap files, not stored
3	Data storage	Scanned data is stored on the drive	Encrypted or unencrypted data (depending on user settings) is stored on the internal drive, but not available to users. The size of data is limited to a chunk of information that has not been yet sent to the server.
4	Data synchronization	Data is sent to the server, and removed from the internal drive.	After data is sent, it is available only on the server (it is removed from the internal drive of the client machine), in the MySQL database. The server access is SSL protected. The database access is additionally password protected. The data stored is stored in same format as it was sent: encrypted, or unencrypted depending on settings. BlueScan® servers are located in Switzerland.
5	Data back-up (optional)	Data back-up for security purposes.	MySQL data is backed up to storage servers. BlueScan® storage servers are in Switzerland. The data access is SSL-protected.

PRIVACY ASSURANCE SUMMARY

- 1.** Data collected by BlueScan® equipment is fully anonymous. Bluetooth and Wi-Fi MAC addresses cannot be tracked down to any specific person-identifying information like phone number, subscription number, IMEI, etc.
- 2.** Data collected can be immediately encrypted with the random key, which changes in time, therefore the appearance of same person cannot be linked in time in the same place, or between different places, where BlueScan® equipment is being used to gather radio signals.
- 3.** Data access on the BlueScan® equipment is password-protected and available only between the moment it is gathered and sent to the server.
- 4.** Server data access is protected by SSL keys and database password. The data on servers is available for maximum of 3 months from the moment of discovery.