Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

You cannot make bricks without clay

Cenex, Vianova & SRM Reti e Mobilità (Bologna)

"Data! Data! Data!"

he cried impatiently.

"I cannot make bricks

without clay."

-Sherlock Holmes by

Arthur Conan Doyle

Agenda

- Open Data – Why is it important to be open about mobility data?
  David Philipson (MEng), Transport Technical Specialist at Cenex
- A European perspective on managing shared mobility with the MDS standard
  Thibault Castagne (MEng), Co-Founder & CEO at Vianova
- How can vehicle data help us to plan sustainable shared mobility?
  Daniel Grist (BEng, MSc), Sustainable Transport Consultant at Cenex
- Behavioural change campaign, measuring the hard to measure.
  Marco Amadori (MEng), Project Technical Manager at SRM Reti e Mobilità

Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

Open Data: Why is it important to be open about mobility data?

David Philipson

Transport Technical Specialist

Agenda

1. What is open data?
2. Why now?
3. What role should cities play?
4. What are the benefits?
5. Case Studies

What is Open Data?

1. Availability and Access: Data must be available as a whole. The data must also be available in a convenient and modifiable form.
2. Re-use and Redistribution: The data must be provided in terms that permit re-use and redistribution including the intermixing with other datasets.
3. Universal Participation: Everybody must be able to use, re-use and redistribute the data with no discrimination against fields of endeavor, persons or groups. There should be no restrictions.

What is Open Data?

Interoperability

Why Now?

- There's a long history of cities capturing traffic and pedestrian data. This has been in both analogue and digital formats with data sizes limited by equipment and processing capabilities.
- We have been in a technology revolution over the past decade with smart phones, apps, data storage and computing power 10x what it was in 2015, and 5G just around the corner.
- We are at a critical point for decarbonisation and any and all avenues must be explored.

What role should cities play?

Build a framework of confidence

Facilitators

Negotiate with 3rd parties at what level data will be open access.

Open access for all relevant data collected by the city.

Investment

What are the benefits?

1. Increased operational efficiency.
2. Improved accessibility for vulnerable and non-vulnerable users.
3. A transport network that works in harmony not in conflict.
4. Reduced carbon emissions.
5. Smart and long term transport planning.
6. Job creation through innovative start ups.
7. The option to plan a truly integrated multi-modal trip that is, with single ticketing payments across a range of transport vehicles and routes.

Case Study: TfL & EMT Madrid

TfL and EMT Madrid, view transportation data as being public information and as such, should be included in the public expenditure.

Rather than run up the expenditure by creating their own transit or trip planning apps, they open their data so that private companies like CityMapper or Waze can use it to enhance their own mapping services.

The private sector offers many high quality services which serve the commuting public's interests, allowing transport authorities to invest their money more wisely.

Case Study: Rennes

Rennes was on of the first cities in France to launch an open data portal to power a digital ecosystem.

Data2B compiled an open data platform and implemented a project with the mobility provider Keolis who operate a local transportation network.

Data2B developed a predictive software aimed at improving the accessibility of local buses. It combined weather, event, and historic ticketing datasets to predict how full buses will be.

Case Study: Rennes

The application allows riders to have a better idea of whether or not they should wait for a second bus with more space. In addition, Keolis itself benefits in improved operational efficiency.

The service provides more accurate readings on when and where more buses should be deployed in accordance with major events, but can also help the operator decide when to send a smaller bus helping to reduce fuel consumption and carbon emissions.

Case Study: Rennes

Data2B have also worked with local bike-sharing providers to improve the efficiency of bike redistribution across its network. This helps teams decide where and when they should move bikes between stations.

It predicts which stations will be in high demand of bikes, or in high demand of spaces.

It also draws up a more efficient route for teams moving bikes around.

The network is better optimized for users and the operator saves time, money, and carbon emissions.

Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

Thank you for listening

David Philipson

Transport Technical Specialist

David.Philipson@Cenex.co.uk

SuSMo

Trivector

Tuesday 16th June 11 am BST. This is how Gothenburg is expanding the shared mobility scene.

- ***Introduction*** Axel Persson @ Trivector
- ***The road to the next bike share scheme in Gothenburg*** – Planning, procurement and integration with e-scooters - Sara Boije af Gennäs @ Trivector
- ***Mojo - Campus MaaS and hub demonstrator, Business model and efficient procurement for a sustainable mobility*** – Rasmus Sundberg @ Trivector

Better integrating future mobility

A EUROPEAN PERSPECTIVE ON MANAGING SHARED MOBILITY WITH THE MDS STANDARD

thibault.castagne@vianova.io

WEBINAR CENEX

EXPLOSION OF NEW MOBILITY SERVICES BRING CHAOS TO CITY STREETS

CONTEXT IN EUROPE

500,000 shared micro-mobility vehicle in **Europe**
(x 5 in the next 5 years)

E-Scooter Havoc Across French Cities. Is A Crackdown Needed?

Marseille puts the brakes on scooter chaos with licence restrictions

—

The UK finally welcomes e-scooters

Coronavirus has prompted the government to rethink its transport infrastructure.

BETTER INTEGRATING NEW MOBILITY IN THE PUBLIC REALM

VISION

Cities need **tools and access to data** to better manage new mobility solutions

VIANOVA

VIANOVA IN BRIEF

VIANOVA

We are:

- Paris-based startup **creating systems and insights to manage the public realm for cities** in order to ensure micro-mobility, delivery, shared and autonomous vehicles and other new mobility supports an efficient and equitable public realm.
- **Live in 7 cities, including Brussels and Zurich**, and work with 15 operators, including Uber, Voi and Bird
- **Experienced team of 12 people**, with background in mobility planning, product management, and technology from Transport for London, Renault-Nissan and Google
- Awarded several innovation prizes in France, Switzerland and Europe for connected vehicles and mobility management

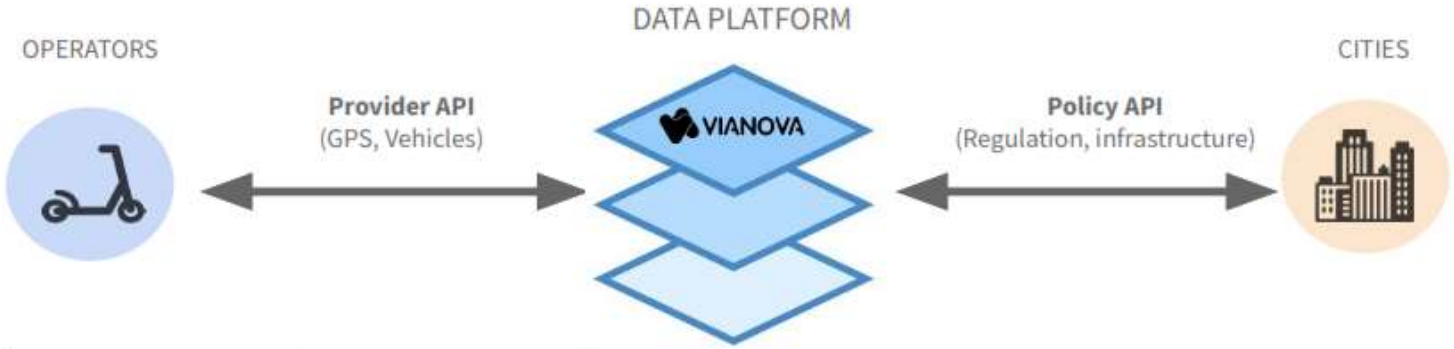
Our offices:

Vianova GmbH
Selnaustrasse 25, 8001 Zürich, Switzerland

Vianova SAS
55 rue la Boétie, Paris, France

CITY-LED DATA PLATFORM FOR MOBILITY MANAGEMENT

VIANOVA



1 - Craft informed policies based on **data-driven insights**

2 - **Enforce policies** *(fleet size, speed, parking)*

3 - **Measure** & ensure progress toward **city goals** *(safety, sustainability, equity)*

4 - Support **urban planning decisions**

5 - Monitor **daily activity** *(deployments, incidents)*

USE OF PUBLIC SPACE → PERMIT → DATA REQUIREMENTS

DATA SHARING

A very good opportunity for cities to establish data sharing requirements

GUIDELINES FOR CITY-LED DATA PROJECT

DATA SHARING

1. Define **city objectives** in the collection and processing of mobility data
   - Broad enough / May evolve in the future

2. Include **data sharing requirement in operators permits** (part of a tender or license)
   - Communicate the city objectives
   - Precise data format, ask for granular data, historical & real-time

3. **Plan kick-off meeting** to transparently communicate project purposes and expectations

4. Set and sign **standardised** license agreements:
   - **Bi-party license agreement** between the city and the operators
   - Specify the **city objectives** and precise Use Cases
   - Ask for **specific international format,** MDS or GBFS (**historical** and real-time)
   - Containing **vehicles ID** for enforcement and other use cases
   - **Responsibilities** regarding **GDPR compliance & confidentiality**

5. **Provide list of Authorised Users** with defined access and rights

MOBILITY DATA SPECIFICATION

MDS FORMAT

Endpoint: /trips
Method: GET
Required/Optional: Required
Schema: trips schema
data Payload: { "trips": [] }, an array of objects with the following structure

Field	Type	Required/Optional	Comments
provider_id	UUID	Required	A UUID for the Provider, unique within MDS
provider_name	String	Required	The public-facing name of the Provider
device_id	UUID	Required	A unique device ID in UUID format
vehicle_id	String	Required	The Vehicle Identification Number visible on the vehicle itself
vehicle_type	Enum	Required	See vehicle types table
propulsion_type	Enum[]	Required	Array of propulsion types; allows multiple values
trip_id	UUID	Required	A unique ID for each trip
trip_duration	Integer	Required	Time, in Seconds
trip_distance	Integer	Required	Trip Distance, in Meters
route	GeoJSON FeatureCollection	Required	See Routes detail below
			The approximate level of accuracy,

- **Open-source, collaborative,** mobility data format
- Governance by non-profit **Open Mobility Foundation**
- Management of **scooters, dockless bikes, ride-hailing services, buses & delivery vehicles**
- Adhere to best practices of privacy standards
- 80 cities using the standard, and more than 30 operators
  - Europe: Zurich, Helsinki, Bruxelles, Lisbon, Lyon, Marseille, Vienna, Antwerp, etc.

PROVIDERS API:

- Historical & granular data
- Trips information & vehicles status

POLICY API:

- Standardised data for geo-fenced regulation

Agency API:

- Real-time vehicle telemetry

https://github.com/openmobilityfoundation/mobility-data-specification

THE DIFFERENCE BETWEEN GBFS & MDS

MDS DATA

GBFS	MDS
General Bikeshare Feed Specification, created by **NABSA** in Nov-15	Mobility Data Specification, created by **LADOT** in Sept-2018
Live-feed of bike **locations and availability**	Live- and historical feed of vehicles **locations, trips, routes and status**
Read only API	**Bilateral** exchange of information
Micro-mobility (Bike share)	**All devices** in the MaaS (scooter, car, ride-hailing, etc.)
Open-Data	Confidential information and potentially personal (GDPR ruling)
Bikeshare system availability for end-user Travel information	**Transport planning and regulation enforcement for government agencies**

HOW MOBILITY DATA CAN SHAPE THE POST-COVID URBAN MOBILITY SYSTEM

POST-COVID

Creating mobility hubs to ease e-scooters parking

1 Drop-off insights from micro-mobility vehicles to map best locations for mobility hubs

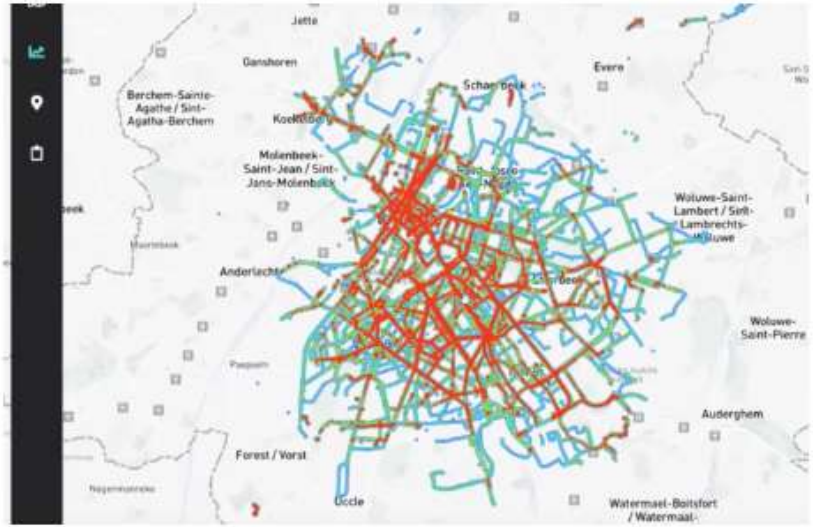
2 Create mobility hubs on selected locations & publish them to operators with the Policy API

3 Monitor usage of the hubs and verify compliance of operators in real-time

HOW MOBILITY DATA CAN SHAPE THE POST-COVID URBAN MOBILITY SYSTEM

POST-COVID

Decision making on infrastructure investments (cycling lanes)

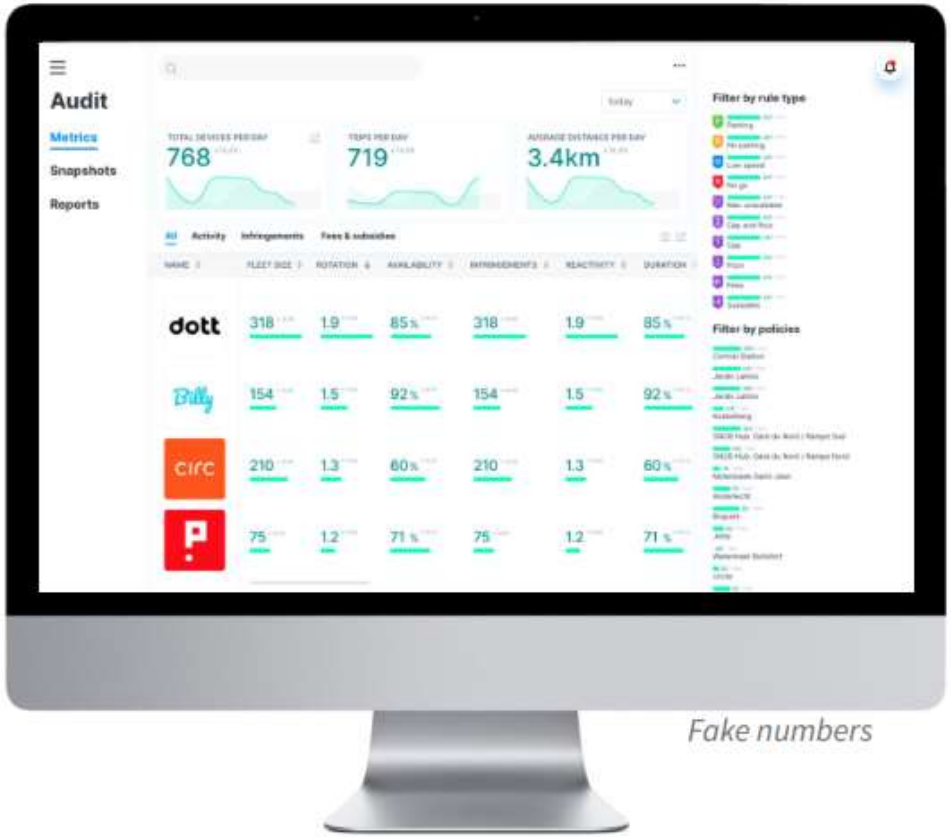


- Lots of cities have decided to extend considerably their network of cycling lanes post-covid to **promote micro-mobility**
- **Aggregated routes** from all shared e-scooters and bikes
- Comparison with existing infrastructure and road safety data

New cycling lanes in Paris

HOW MOBILITY DATA CAN SHAPE THE POST-COVID URBAN MOBILITY SYSTEM

POST-COVID



Fake numbers

Define the right mobility mix & analyse multimodality

- **How, when and where e-scooters are mostly used ?** understand usage patterns
- Monitor KPIs like **vehicle rotation** and decide on the right fleet sizing per vehicle type & per tender
- **Study multimodality patterns** by analysing the micro-mobility trips starting or ending by the train stations

GDPR APPLIES TO CERTAIN MOBILITY DATA

GDPR

- MDS data contains Vehicle ID: considered **indirect personal data** (GDPR article 4.1)

- **Risks of user re-identification** through MDS data **should not be exaggerated,** but **GDPR guidelines** need to be respected

- Municipalities are **allowed to collect MDS data**, as part of their duty performed in the **public interest** (GDPR article 6-1)

- Data should only be **processed and stored for the defined purposes** (vehicle ID, single trips)

COMPLYING WITH GDPR AS DATA PROCESSOR

GDPR

- Route & trips information only obtainable after the **trip ended**
- Various **aggregation techniques** are used in order to prevent re-identification
- We apply **data minimisation** principles (Article 5.1(c) GDPR) - Retention of Vehicle ID
- Strict access control and **data segregation** are enforced
- We **do not resell data** nor attempt to re-identify individuals

CONCLUSION

VIANOVA

- **MDS is about much more than e-scooters**
- It is an **international standardised format**, used across the US and now Europe
- Cities **already collect personal data** for parking enforcement and other purposes
- **Cities shouldn't fear collecting mobility data,** but embrace it to drive forward sustainable new mobility solutions
- Cities/third parties **can work within the GDPR rules** to securely manage this data

What Mobility Data for **Which Purpose**

THE DATA LAYER TO MANAGE AND REGULATE FUTURE MOBILITY IN THE PUBLIC REALM

THANK YOU

Contact me for any information:

Thibault Castagne
Cofounder & CEO of Vianova

thibault.castagne@vianova.io

+ 33 6 17 87 49 21

Paris, France | Zurich, Switzerland

Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

How telematics can strengthen sustainable shared mobility planning

Daniel Grist

Sustainable Transport Consultant, Daniel.Grist@Cenex.co.uk

Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

Agenda

Aim: highlight the case for using telematics when planning shared mobility projects.

1. **What data is needed to assess shared mobility projects.**

2. **Show how telematics can be used to collect the data.**

Transport | Energy Infrastructure | Knowledge & Enterprise

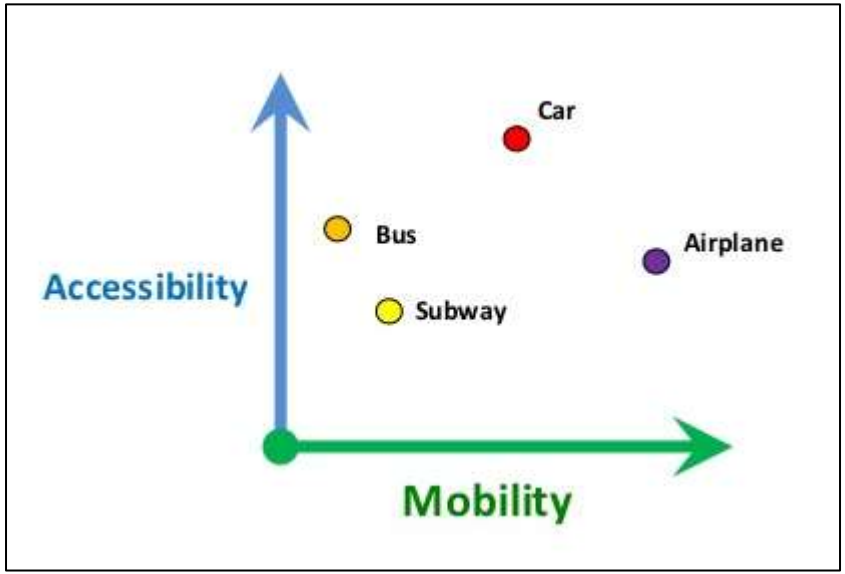
cenex

Assessing Shared Mobility

What data are needed to assess shared mobility?

(1) Assessing shared mobility – Accessibility vs Mobility

- A highly accessible transit system provides service near every home and business but must frequently stop and thus travel slowly.
- A highly mobile transit service moves many passengers quickly but only along major transit corridors and between major destinations.
- A personal car is both highly accessible and highly mobile so has been selected. Shared mobility must compete with the accessibility and mobility of personal cars.



(1) Assessing shared mobility – Accessibility vs Mobility

Accessibility is the measure of the potential to interact with opportunities.

Mobility is the measure of the realisation of the potential to interact with opportunities.

Data Required

1. Location
2. Cost per unit distance
3. Passenger wait time
4. Average Speed
5. Passenger Miles/Kilometres Travelled

(2) Assessing shared mobility – Fairness & Equality

- Transportation is intrinsically linked to most important quality of life factors. Ease of mobility affects access to education, employment and health services.
- Improved access for disadvantages individuals. Physical & Cognitive impairment, low income, elderly.

Data Required

1. Location
2. Cost per unit distance
3. Passenger wait time
4. Average Speed
5. Passenger Miles/Kilometres Travelled
6. Passenger Information

(3) Assessing shared mobility – Community & Environmental benefits

- Reduce congestion.
- Less energy/resources expended.
- Reduction in pollutants & greenhouse gas emissions.

Data Required

1. Location
2. Cost per unit distance
3. Passenger wait time
4. Average Speed
5. Passenger Miles/Kilometres Travelled
6. Passenger Information
7. Energy Consumption
8. Emissions

(4) Assessing shared mobility– Economic benefits

- Shared mobility results in greater utilization of assets which results in savings.
- Shared mobility reduces congestion. Congestion is costly (EU €100 billion/year).
- Shared mobility is cheaper as we do not need to buy assets.

Data Required

1. Location
2. Cost per unit distance
3. Passenger wait time
4. Average Speed
5. Passenger Miles/Kilometres Travelled
6. Passenger Information
7. Energy Consumption
8. Emissions
9. Utilization

Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

Assessing shared mobility – Quantifiable Data

Data Required

1. Location
2. Cost per unit distance
3. Passenger wait time
4. Average Speed
5. Passenger Miles/Kilometres Travelled
6. Passenger Information
7. Energy Consumption
8. Emissions
9. Utilization

Telematics Examples

How to collect the required data?

Telematics Examples

- Vehicle tracking telematics.

- Vehicle interactive telematics.

- Passenger tracking telematics.

Vehicle Tracked Telematics – Driving Example

Date and time	Latitude	Longitude
08/02/2020 20:38:30	52.4978	0.107480
08/02/2020 20:38:31	52.4979	0.107481
08/02/2020 20:38:32	52.4980	0.107483
08/02/2020 20:38:33	52.4981	0.107486
08/02/2020 20:38:34	52.4985	0.107490
08/02/2020 20:38:35	52.4986	0.107495
08/02/2020 20:38:36	52.4987	0.107500
08/02/2020 20:38:37	52.4988	0.107501
08/02/2020 20:38:38	52.4990	0.107503
08/02/2020 20:38:39	52.4992	0.107509
08/02/2020 20:38:40	52.4995	0.107510
08/02/2020 20:38:41	52.4996	0.107512
08/02/2020 20:38:42	52.4997	0.107515
08/02/2020 20:38:43	52.4999	0.107519
08/02/2020 20:38:44	52.5001	0.107520

Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

Vehicle Tracked Telematics – Analysis Example

Date and time	Speed (km/h)	Latitude	Longitude	% utilization	PKT - Cumulative Distance (km)	Average £/km	Average Speed km/h	Fuel Consumed (L)	TTW kg.CO2e	WTW kg.CO2e
08/02/2020 20:40:34	23	52.4978	0.107480	0.80%	0.06	0.13201	23.00	0.00	0.01	0.01
08/02/2020 20:40:35	20	52.4979	0.107481	1.59%	0.07	0.1282	21.50	0.00	0.01	0.01
08/02/2020 20:40:36	18	52.4980	0.107483	2.36%	0.09	0.13295	20.33	0.01	0.01	0.01
08/02/2020 20:40:37	13	52.4981	0.107486	3.13%	0.10	0.1345	18.50	0.01	0.01	0.02
08/02/2020 20:40:38	12	52.4985	0.107490	3.88%	0.12	0.13682	17.20	0.01	0.02	0.02
08/02/2020 20:40:39	17	52.4986	0.107495	4.62%	0.13	0.13805	17.17	0.01	0.02	0.02
08/02/2020 20:40:40	23	52.4987	0.107500	5.34%	0.15	0.134	18.00	0.01	0.02	0.02

Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

Vehicle Tracked Telematics – Live Analysis Example

Utilization	PKT	Km/h
0%	0	0

Pence/km	Litres
0	0

TTW kg.CO2e	WTW kg.CO2e
0	0

Vehicle Interactive Telematics – Analysis Example

Date and time	Speed (km/h)	Latitude
08/02/2020 20:40:34	23	52.4978
08/02/2020 20:40:35	20	52.4979
08/02/2020 20:40:36	18	52.4980
08/02/2020 20:40:37	13	52.4981
08/02/2020 20:40:38	12	52.4985
08/02/2020 20:40:39	17	52.4986
08/02/2020 20:40:40	23	52.4987

Data Required

1. Location
2. Cost per unit distance
3. ~~Passenger wait time~~
4. Average Speed
5. Passenger Miles/Kilometres Travelled
6. ~~Passenger Information~~
7. Energy Consumption
8. Emissions
9. Utilization

equipment to interact with
es.

ability to decipher vehicle
IBUS).

for vehicle pattern analysis
er energy level.

Passenger Tracking Telematics – Analysis Example

Date and time	Speed (km/h)	Latitude	Longitude	Energy Level
08/02/2020 20:40:34	4	52.4978	0.107480	-
08/02/2020 20:40:35	4	52.4979	0.107481	-
08/02/2020 20:40:36	4	52.4980	0.107483	-
08/02/2020 20:40:37	0	52.4981	0.107486	-
08/02/2020 20:40:38	6	52.4985	0.107490	62.8%
08/02/2020 20:40:39	10	52.4986	0.107495	62.8%
08/02/2020 20:40:40	15	52.4987	0.107500	62.8%

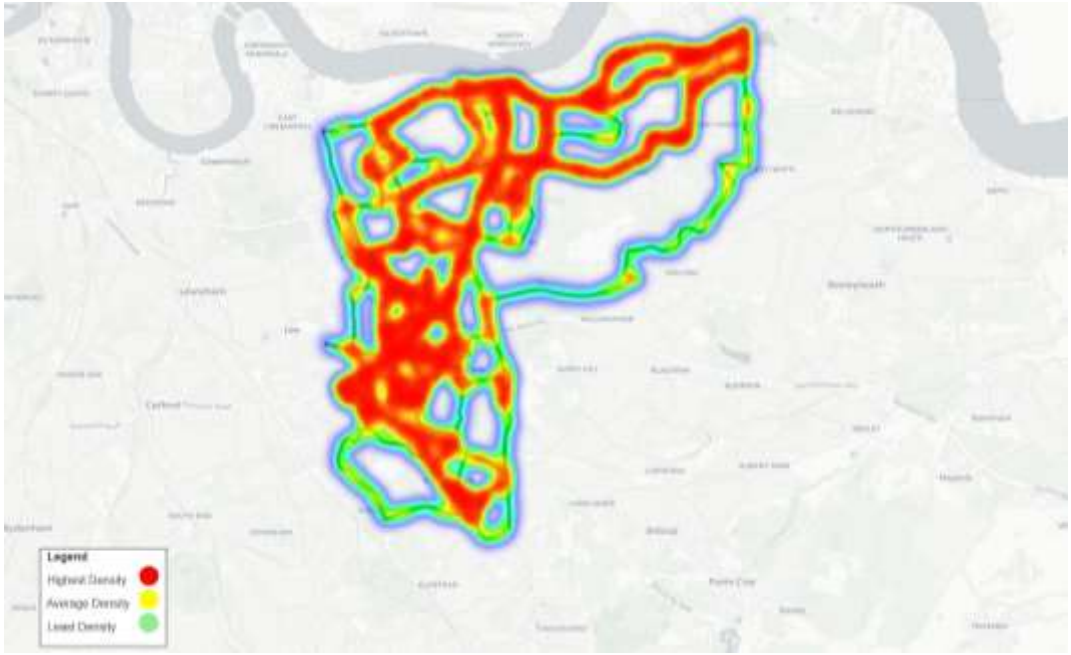
- Passenger data could be collected from journey start, perhaps app, MAAS etc.
- Requires vehicle tracking for energy level/could exclude and use modelled energy consumption method.

Transport | Energy Infrastructure | Knowledge & Enterprise

cenex

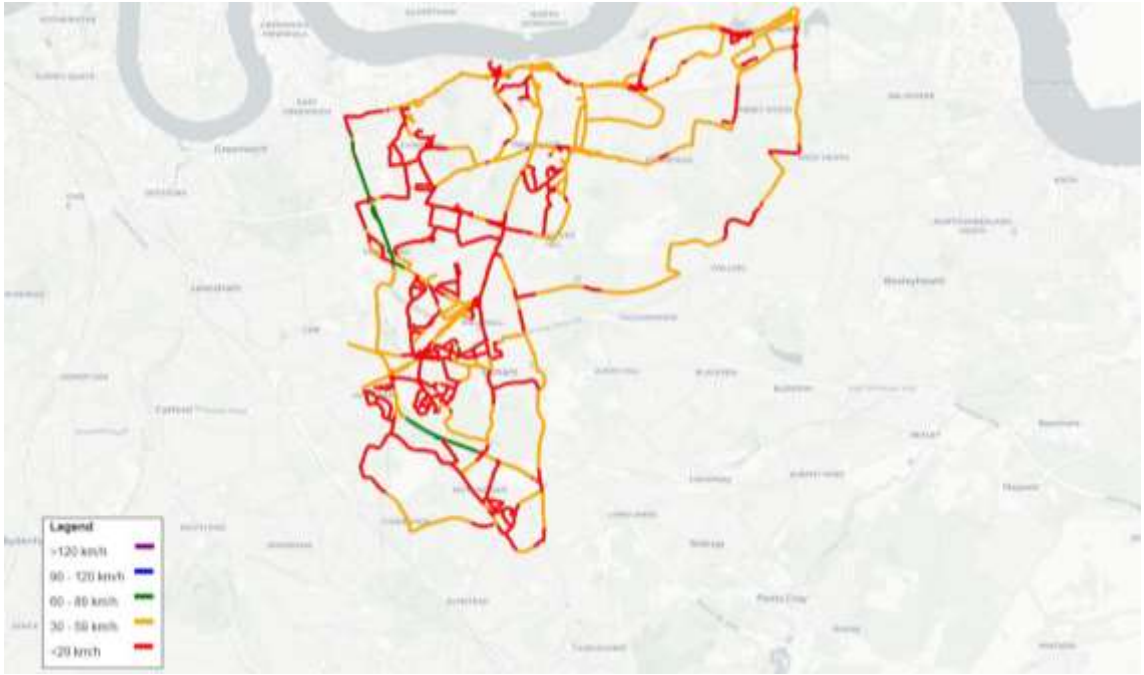
Visual uses of Telematics

Vehicle Tracked Telematics – Frequented Locations



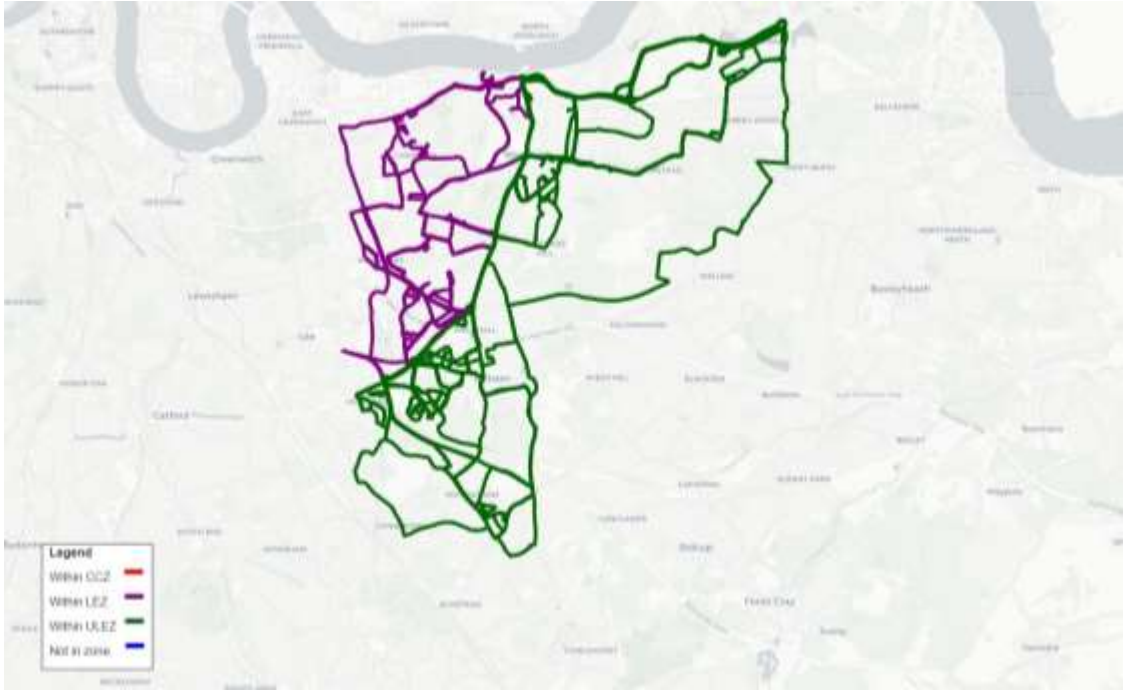
- Placement of infrastructure.
- Areas unserved?

Vehicle Tracked Telematics – Speed maps



- Where is congestion (% below signage speed).
- Overlap with incidents?

Vehicle Tracked Telematics – Zone Analysis



- How successful would a zone be?
- Economic case for emissions reductions in fleets (EV Car sharing etc).

SuSMo cenex

Summary

We looked at some examples of how we can assess shared mobility projects.

Selected an example list of useful data that could be obtained via telematics.

Discussed methods of telematics that could collect these data.

Transport | Energy Infrastructure | Knowledge & Enterprise

SuSMo cenex

Thank you for listening

Daniel Grist

Sustainable Transport Consultant, Daniel.Grist@Cenex.co.uk

Bella Mossa

Bologna. Mobilità sostenibile

Behavioural change campaign, measuring the hard to measure

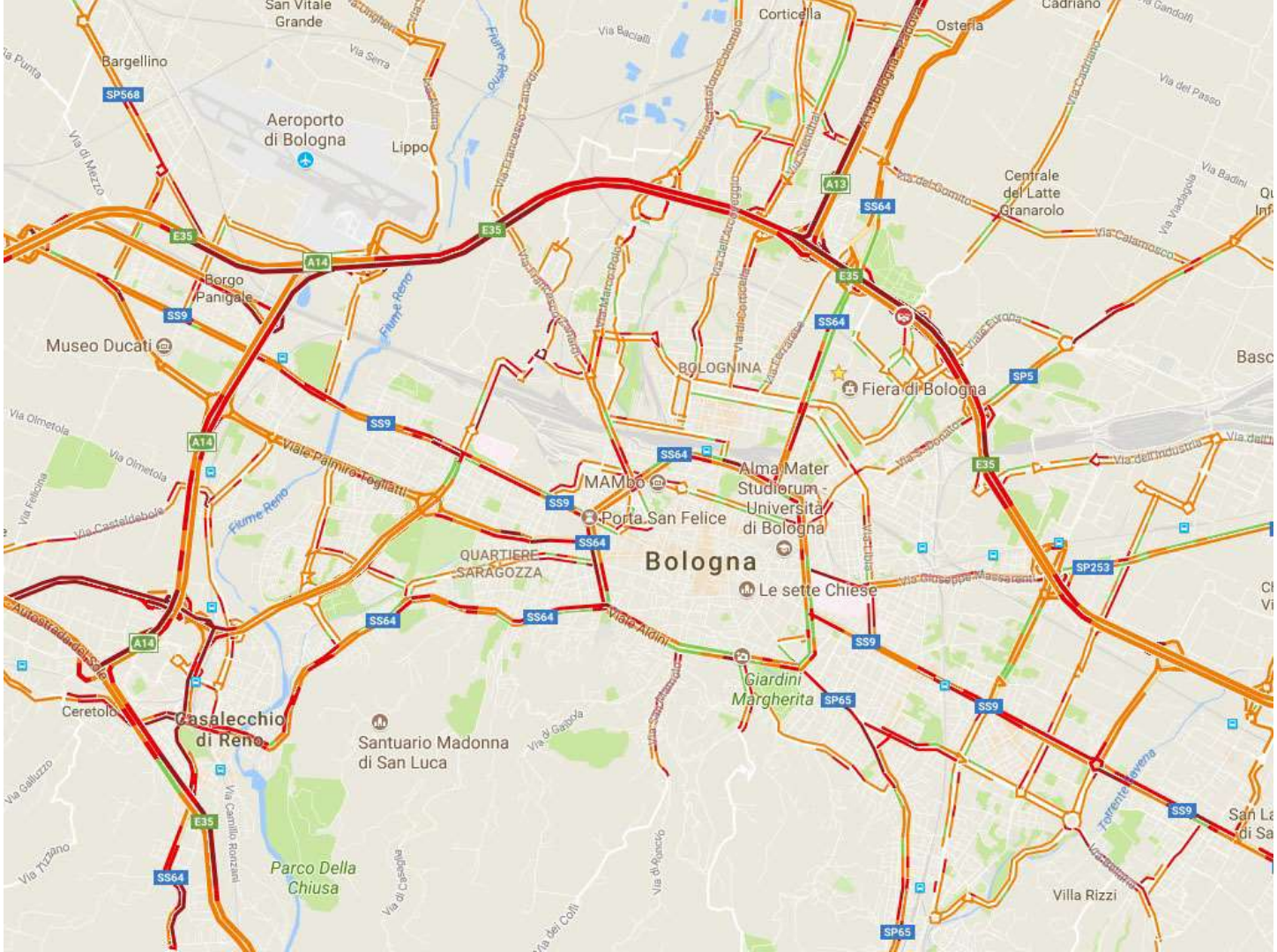
SRM RETI E MOBILITÀ

Tuesday, 9th June 2020

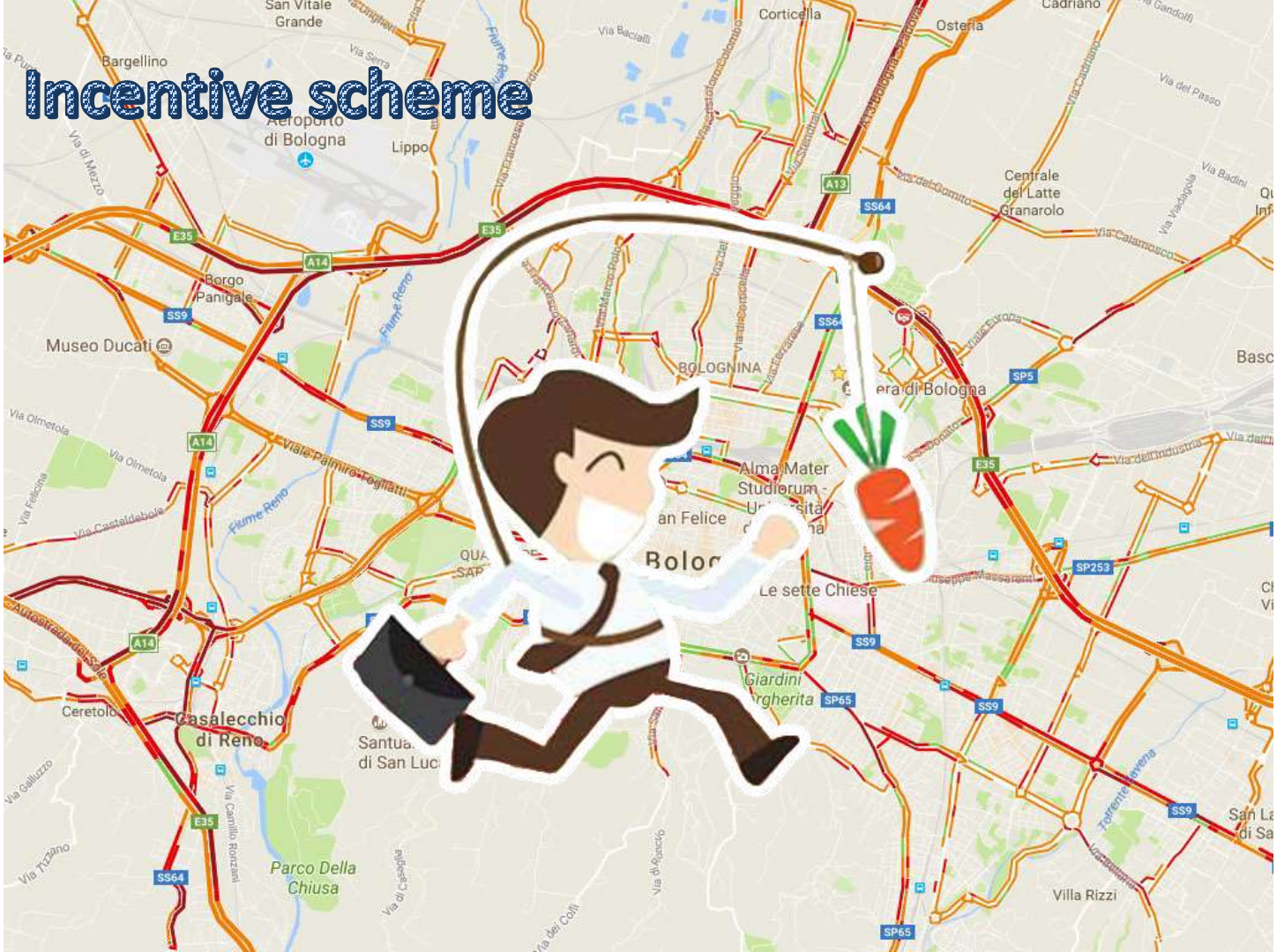
SRM is the local Authority for Public Transport in Bologna area
We tender, award the service and manage the Contract of Service for:

- **Public transport (metropolitan area of Bologna)**
- **Car sharing (city of Bologna)**
- **Bike sharing (city of Bologna)**
- **Parking (city of Bologna)**

We have created, promoted and managed communication and behaviour change campaigns on sustainable mobility for the city and the metropolitan area of Bologna


San Vitale Grande
Bargellino
Aeroporto di Bologna
Lippo
Corticella
Osteria
Cadriano
Centrale del Latte Granarolo
Borgo Panigale
Museo Ducati
BOLOGNINA
Fiera di Bologna
MAMbo
Porta San Felice
Alma Mater Studiorum - Università di Bologna
Bologna
QUARTIERE SARAGOZZA
Le sette Chiese
Giardini Margherita
Ceretolo
Casalecchio di Reno
Santuario Madonna di San Luca
Parco Della Chiusa
Villa Rizzi
Fiume Reno
Viale Aldini
Viale Palmiro Togliatti
SP568
E35
A14
SS9
SS64
A12
SP5
SP253
SP65

Incentive scheme



A game

BetterPoints

Download on the App Store

Get it on Google play

A game

A app

BetterPoints

Download on the App Store

Get it on Google play

A game

A app

Some players

Basic 'loop'

Choose mode → Record trip → Earn points → Get discounts → Choose mode

Choose mode → Record trip → Earn point → Get discounts → Choose mood

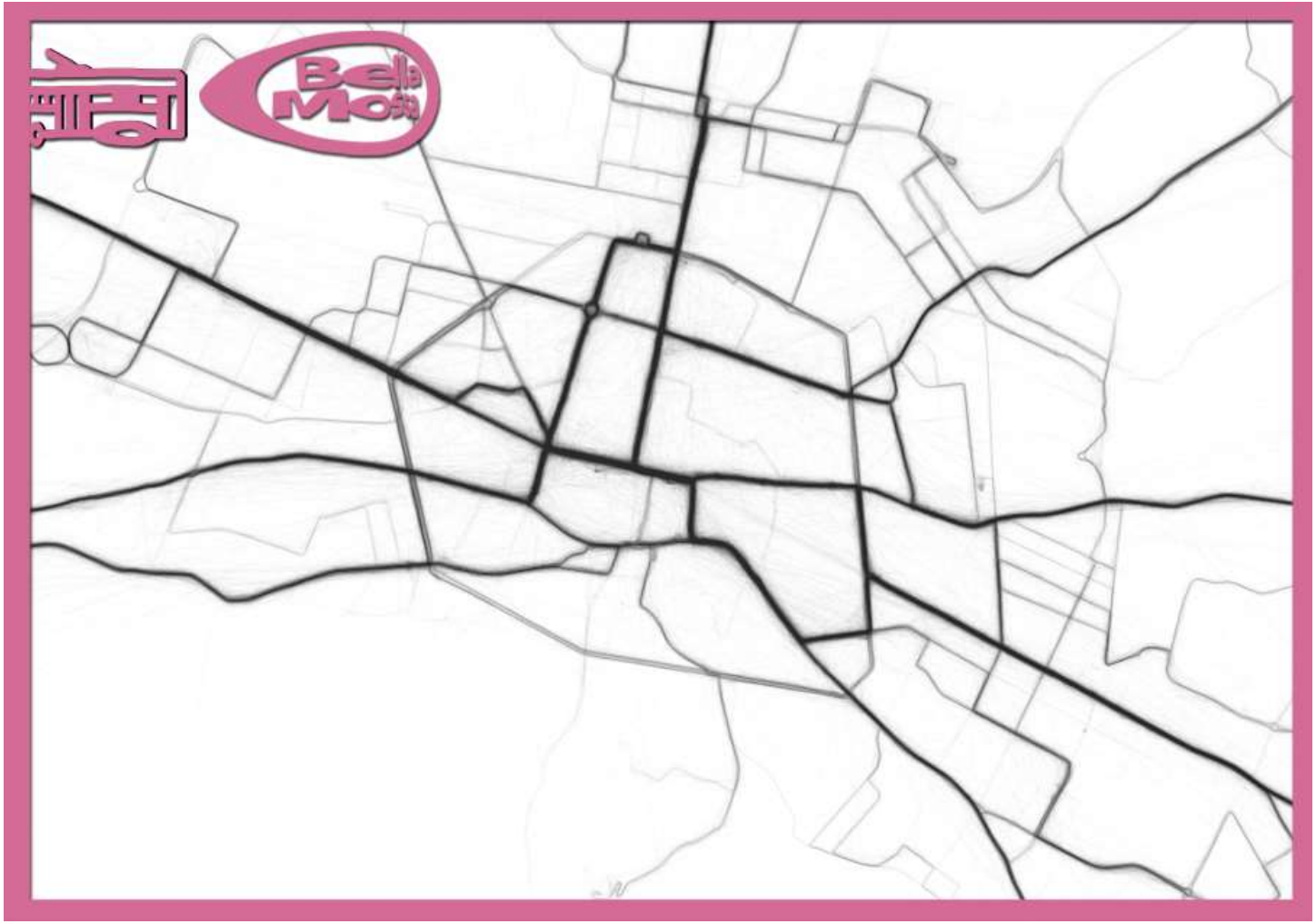
Extended 'loop'

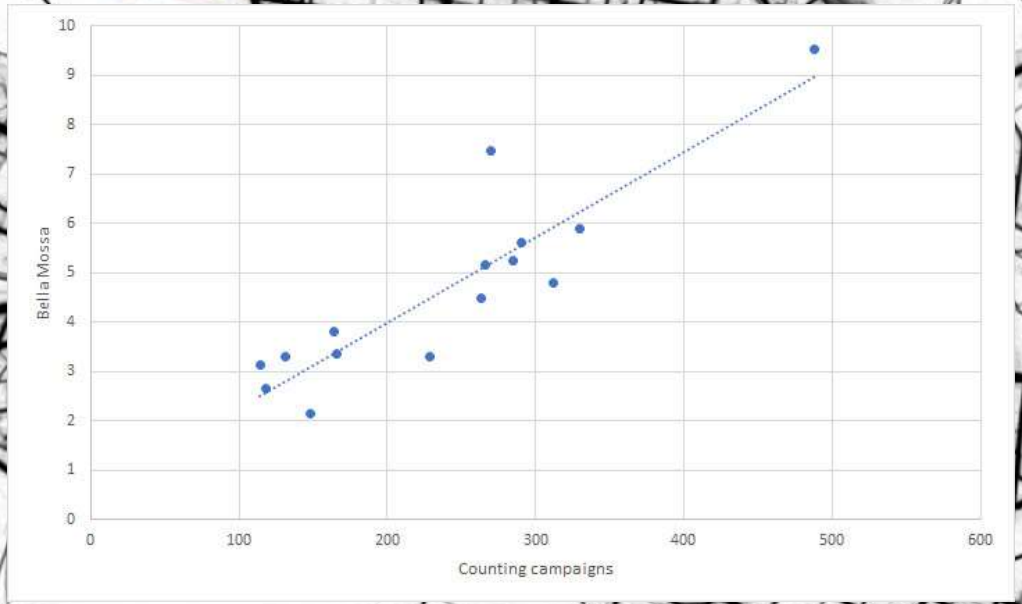
Get more discounts → 5 out of 7 days → Earn extra-points → Get more discounts → 5 out of 7 days → Earn extra-points

Get more discounts → Special events → Earn extra-points → Get more discounts → Special events → Get more discounts

More level of gamification

Results 2018




Bella Mossa
Counting campaigns
0
1
2
3
4
5
6
7
8
9
10
0
100
200
300
400
500
600

Conclusions

- **Measuring people mobility behaviour is possible.**
- **There are different level of measurement.**
- **The deeper, the more difficult (time comsuming, expensive)...**
- **…but a deep measurement does not means «accurate»: it needs to be validated.**
- **Technology helps us…**
- **…but technology needs an help: we found it in Gamification and Inventive Scheeme.**

Resources

https://www.bbc.com/news/av/stories-45940844/the-city-that-gives-you-free-beer-for-cycling

https://www.polisnetwork.eu/wp-content/uploads/2019/06/tc9-dec2017_lo.pdf

Marco Amadori marco.amadori@srmbologna.it

Transport | Energy Infrastructure | Knowledge & Enterprise

cenex

Thank you for listening

Beth Morley

Mobility Project Manager – beth.morley@Cenex.co.uk

If you wish to listen to the recording please contact us.