Workshop App Development: Training Day

http://www.sii-mobility.org

Paolo Nesi, km4city@disit.org

http://www.Km4City.org

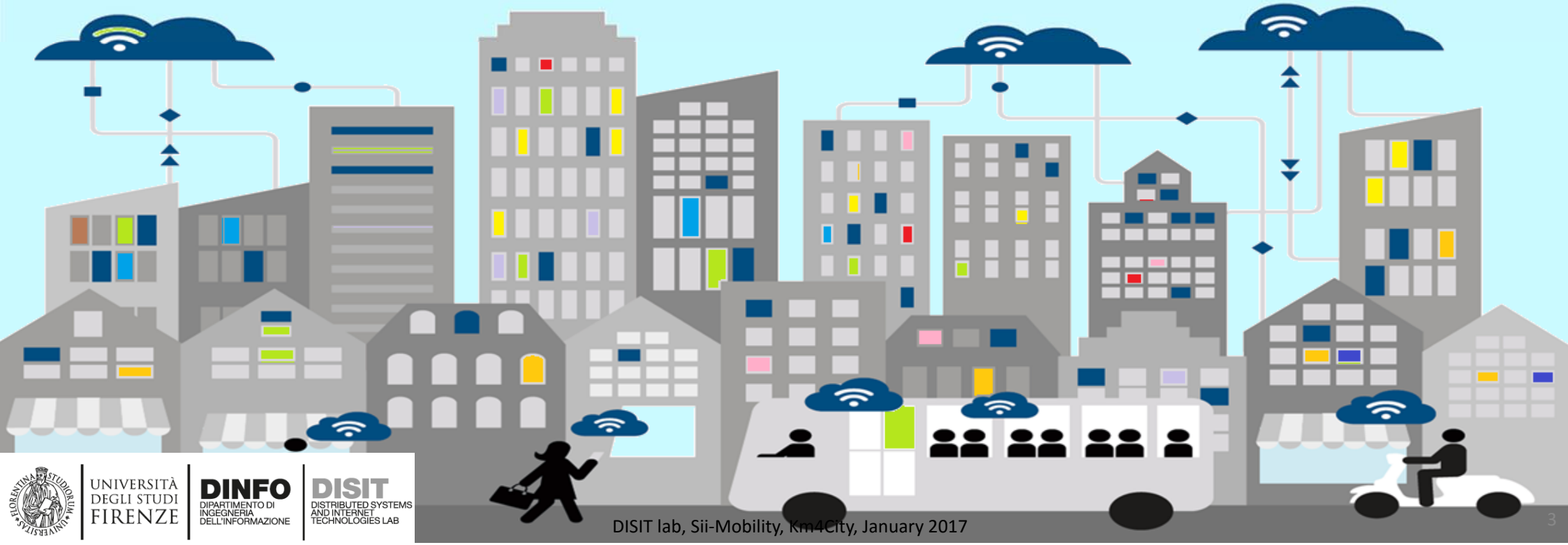
SOME RIGHTS RESERVED

Questions to be sent at km4city@disit.org

Agenda

- 9:00-10:30 http://www.disit.org/6993
  - Sii-Mobility Overview
  - General Model
  - Engaging Users via Apps
  - Overview of development tools for Apps
  - How to Legally work with SDK
  - Planned Additional Modules for the Apps
  - Info and Documents
- 10:30-11:30
  - ServiceMap usage http://www.disit.org/6994
  - Smart City API http://www.disit.org/6995
- 11:00-12:30 http://www.disit.org/6992
  - Sii-Mobility Mobile App Kit on GitHub
  - How to develop new module
- 12:30-13:30: lunch
- 13:30-17:00:
  - Workshop on development: exercitations

Sii-Mobility Overview



UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB http://www.disit.org

Sii-Mobility

MINISTERO DELL'ISTRUZIONE DELL'UNIVERSITÀ E DELLA RICERCA

Commenti dei cittadini, Social Media

Merci

AVM trasporto Pubblico

Sensori, sistema monitoraggio

Sensori su trasporto Privato

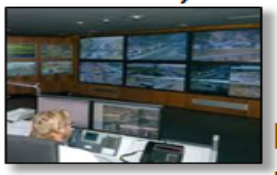
Sensori Parcheggi

UTC

Infomobility

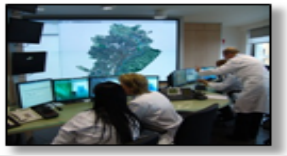
Varchi Telematici, ZTL

Monitoraggio traffico, autostrade



Rete Ferroviaria

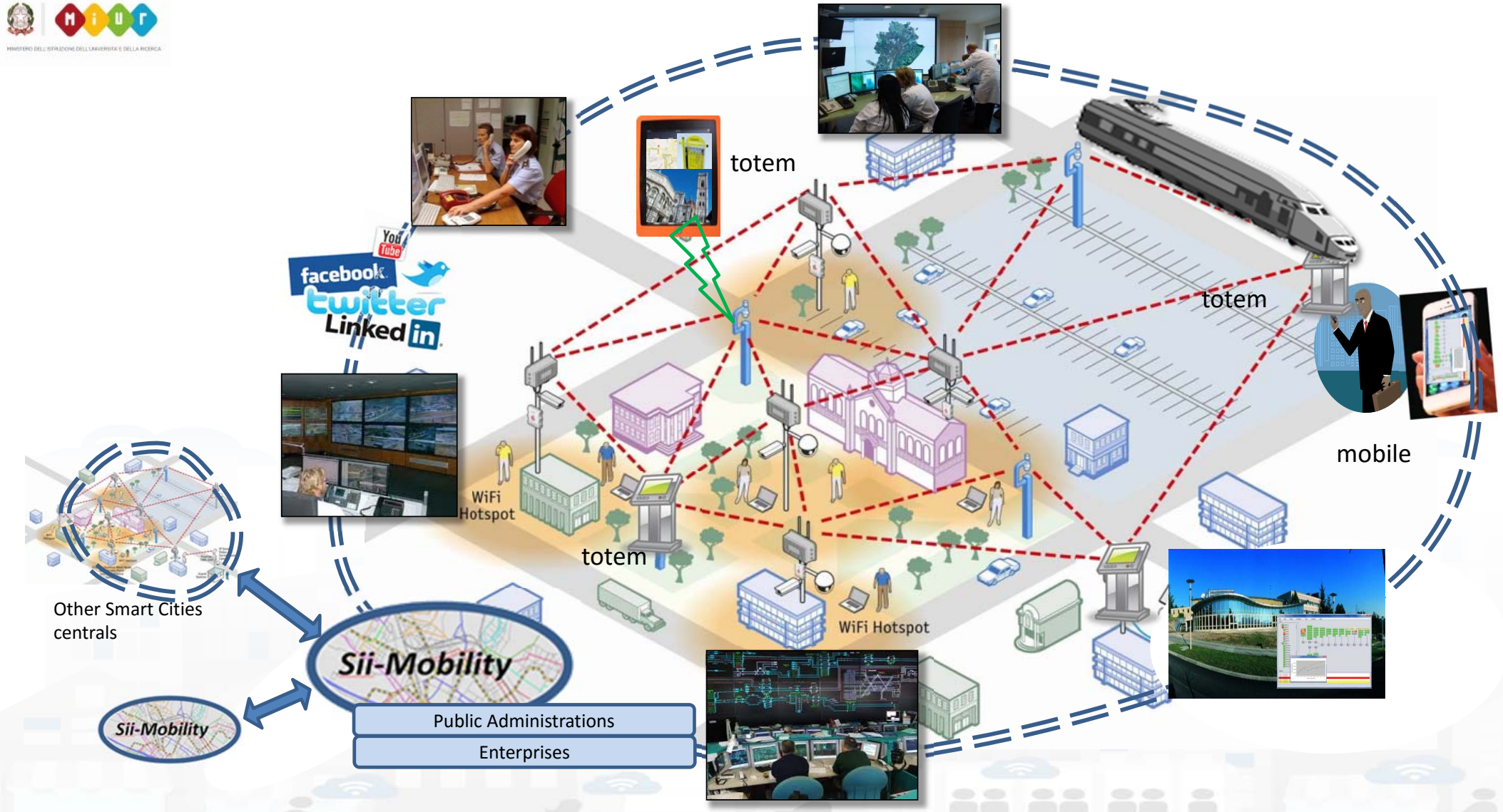
Parametri ambientali



Servizi ed enti

Ordinanze: eventi, lavori pubblici, ..

Emergenze, polizia, 118


totem
totem
totem
mobile
WiFi Hotspot
WiFi Hotspot
Other Smart Cities centrals
Sii-Mobility
Sii-Mobility
Public Administrations
Enterprises
facebook
twitter
Linked in
You Tube

General Objectives

- Reduce the social costs of mobility
  - minor inconvenience,
  - greater efficiency,
  - greater sensitivity to the needs of the citizen,
  - lower emissions,
  - better environmental conditions;
  - info-training programs to help city user in getting virtuous habits;
  - reduce transportation costs and travel times for users, for operators and administrations,
  - optimization solutions.
- **simplify the use of mobility systems**
  - innovative sensors for AVM and private transport on the territory
  - integrated systems for payment and identification
  - driving / offline routing solutions
  - connect the drive, smart drive or walk
  - Integration of data from operators and different type sources
  - advanced management of resources measurement of flows realization of sensors, actuators
- **Testing on municipalities and provinces of Tuscany**
- **Contribute to the improvement of national and international standards**

Sii-Mobility

Sistema Integrato Interoperabile

Decision Maker Tools

City Users' Tools

City Operators and City Open Data sources,

Sensors, Vehicular Kit

Weather, Environment, Traffic, Etc.

Data Gathering and Post Tools

Big Data Modeling and Services Providing Tools

Big Data, Data Analytics, Processes and Smart City, Mobility, etc., Services Management

Km4City Smart City API

Smart City Development Tools

Decision Makers

City Users

Parking sensors

Smart City Mobility Operators, App & Tools Developers

Low level tools for App & Tools Developers

SDK for Algorithm Developers

Other Smart Cities.....

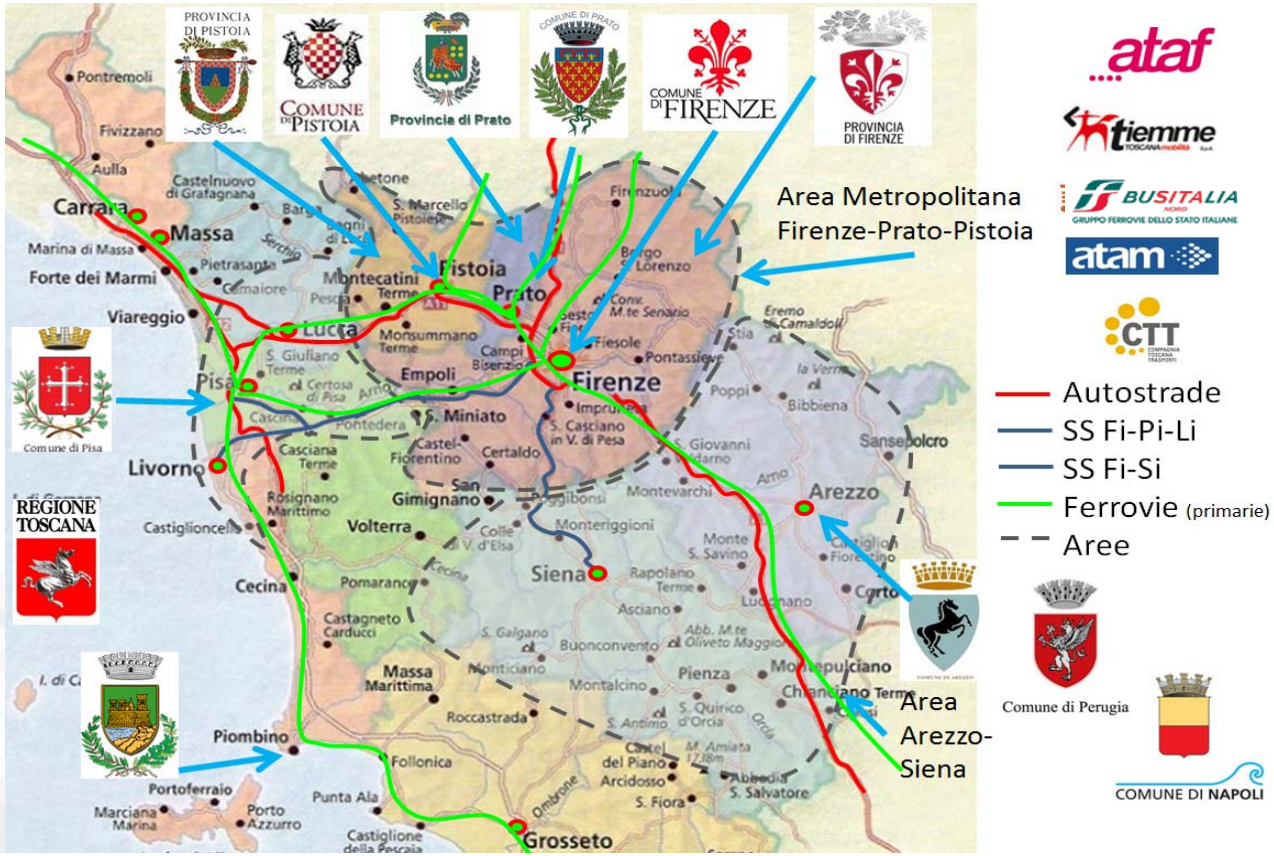
MINISTERO DELL'ISTRUZIONE DELL'UNIVERSITÀ E DELLA RICERCA

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB
http://www.disit.org

Sii-Mobility

- *Experimentations and validation in Tuscany*
- *Integration with present central station and subsystems*
- *DISIT lab, Università di Firenze, is the tech-scientific coordinator*

http://www.Sii-Mobility.org



ECM; Swarco Mizar; Inventi In20; Geoin; QuestIT; Softec; T.I.M.E.; LiberoLogico; MIDRA (autostrade, motorola); ATAF; Tiemme; CTT Nord; BUSITALIA; A.T.A.M.; Effective Knowledge; eWings; Argos Engineering; Elfi; Calamai & Agresti; Project; Negentis

Principali Delibere su Sii-Mobility

PA	Tipo di atto
Provincia di Prato	Delibera di Giunta n.267 del 30.10.2012
Comune di Prato	Delibera di Giunta n.474 del 30.10.2012
Provincia di Firenze	Delibera di Giunta n.147 del 06.11.2012
Comune di Firenze	Delibera di Giunta n.403 del 06.11.2012
Provincia di Pistoia	Delibera di Giunta n.156 del 08.11.2012
Comune di Pistoia	Delibera di Giunta n.321 del 08.11.2012
Comune di Pisa	Delibera di Giunta n.203 del 06.11.2012
Comune di Arezzo	Delibera di Giunta n.498 del 07.11.2012
Regione Toscana	Delibera di Giunta n.249 del 15.04.2013

Transport systems
Mobility, parking

Public Services
Govern, events, …

Sensors, IOT
Cameras, ..

Environment,
Water, energy

Shops, services,
operators

Social Media
WiFi, network

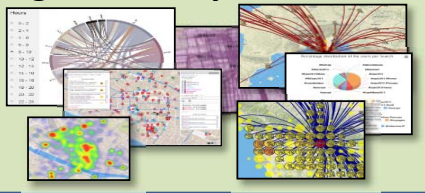
Static, Slow and Real Time data flows

DISCES -- Distributed and parallel architecture on Cloud

Sii: Smart City Engine

Km4City

Big Data Analytics

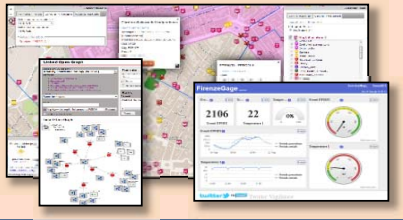


Smartening Tools

Recommender

Personal Assistant

Development Tools

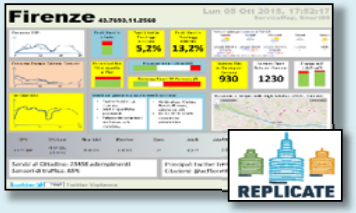


Smart City API

City Operators and Decision Makers

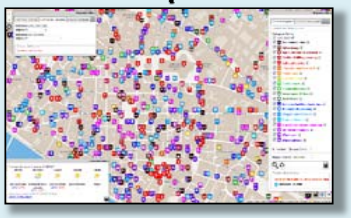
Sii-Mobility

Dashboards



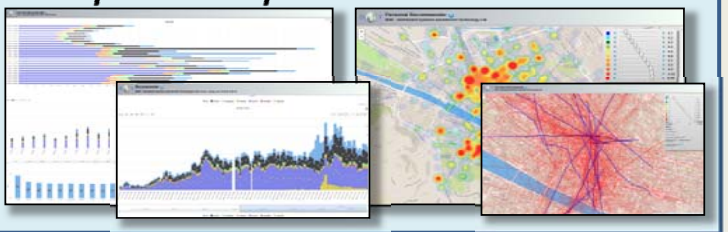
Smart Decision Support

ServiceMap browser



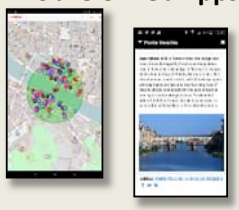
Twitter Vigilance

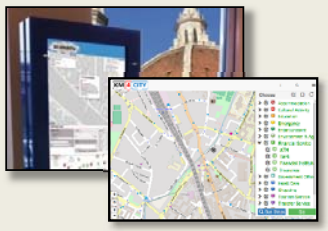
Analyzers of City User Behavior



Tools for Final Users

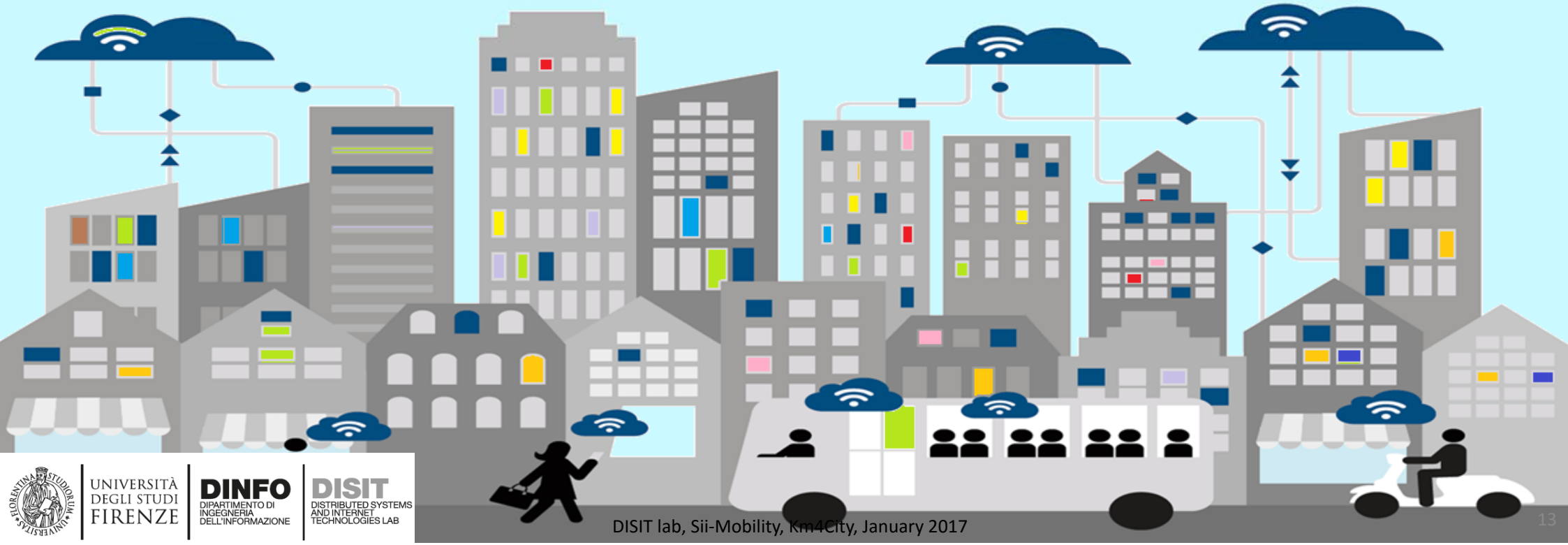
Mobile e Web Apps





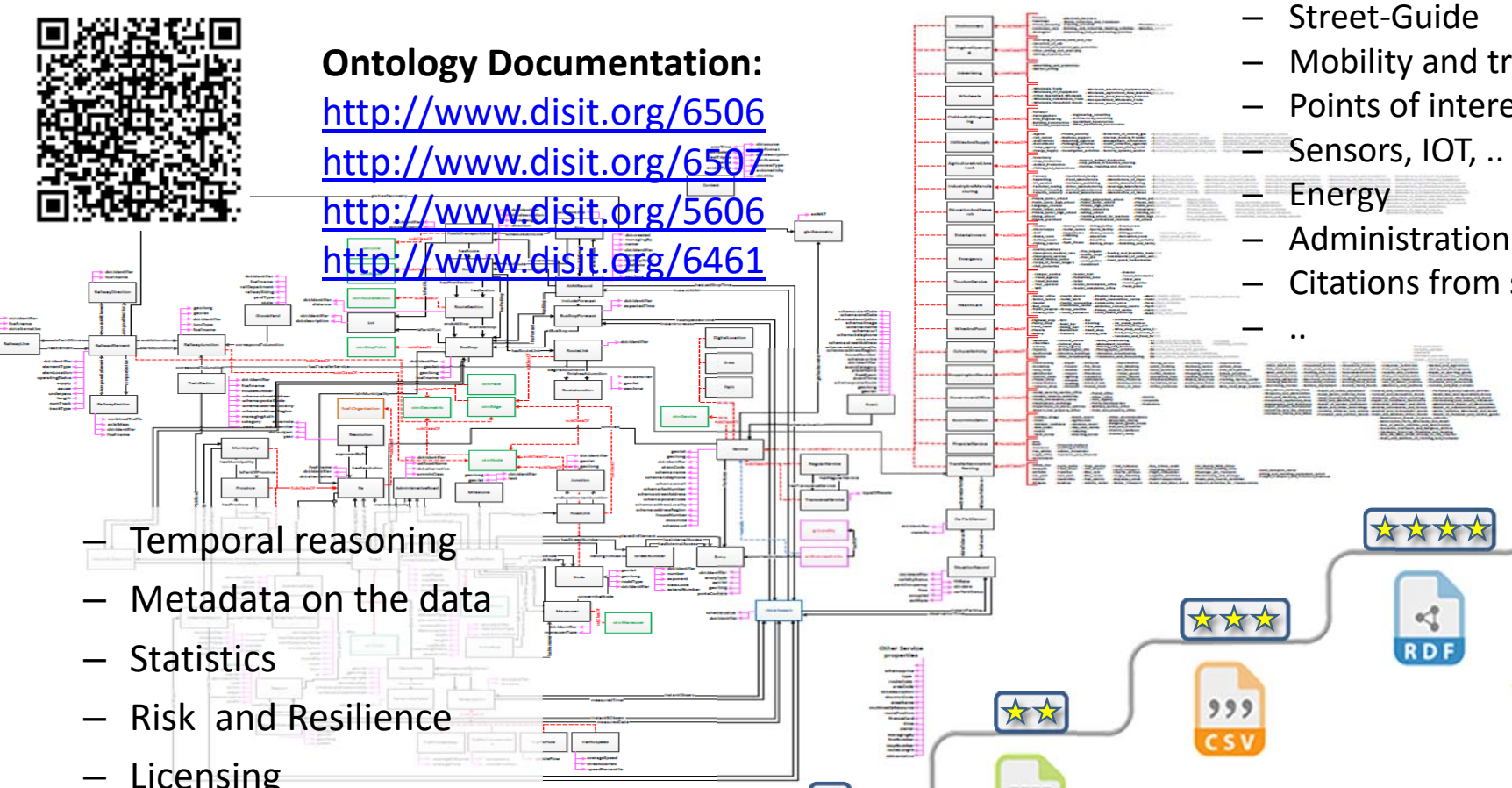
[Http://www.km4city.org](http://www.km4city.org)

General Model



Km4City Ontology - RDF Store

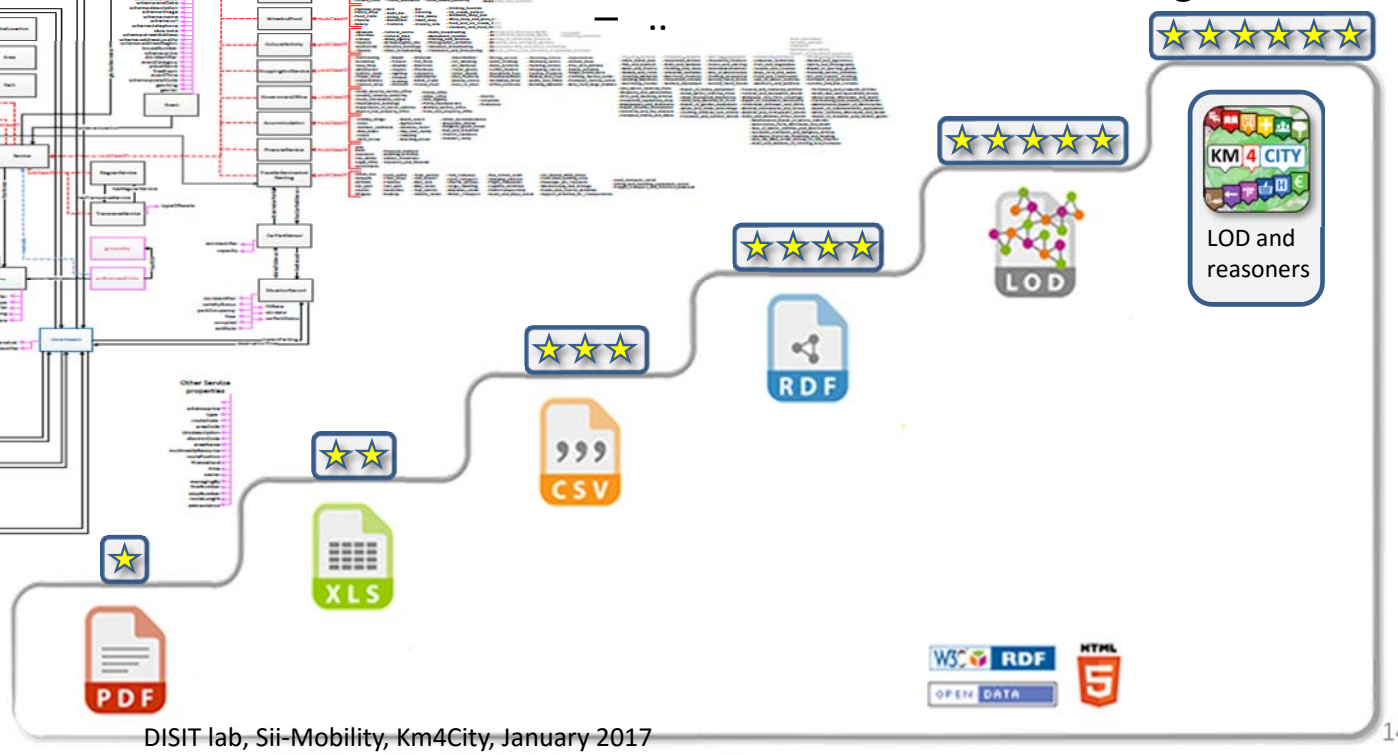
Ontology Documentation:
http://www.disit.org/6506
http://www.disit.org/6507
http://www.disit.org/5606
http://www.disit.org/6461

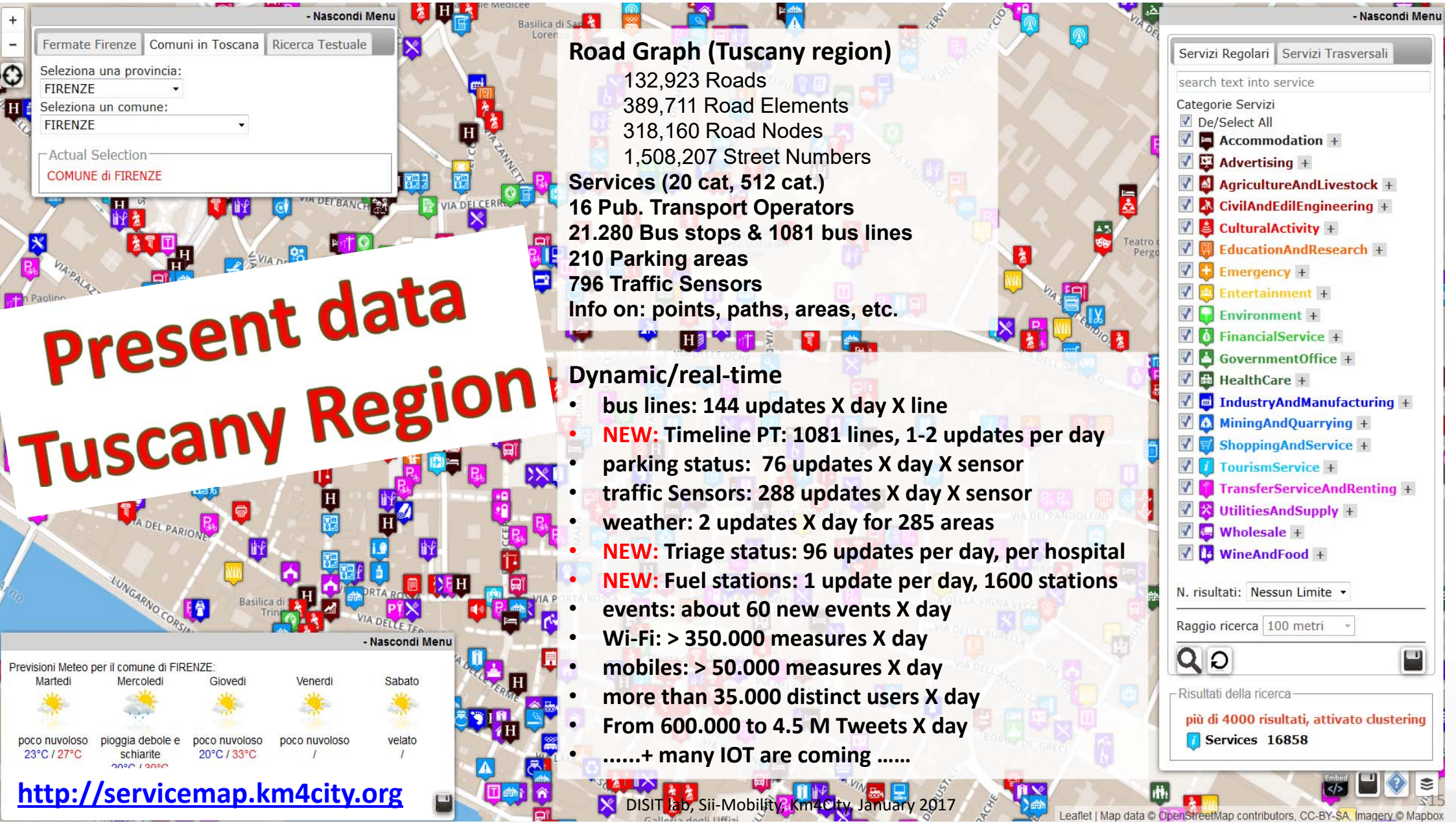


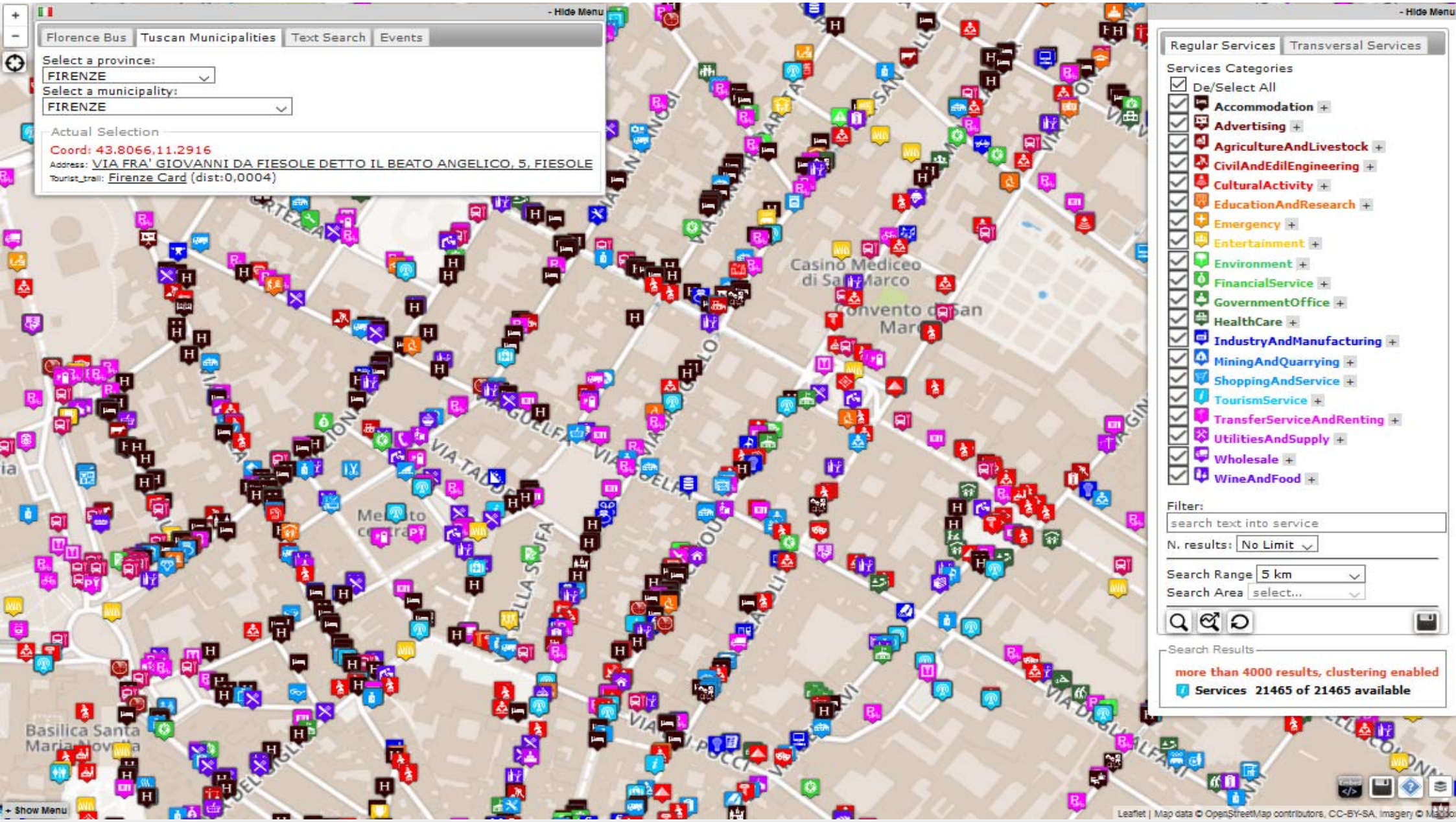
- Temporal reasoning
- Metadata on the data
- Statistics
- Risk and Resilience
- Licensing
- Open and Private Data
- Static and Real time
- ..

- Street-Guide
- Mobility and transport
- Points of interest
- Sensors, IOT, ..
- Energy
- Administration
- Citations from strings
- ..

Big Data Tools

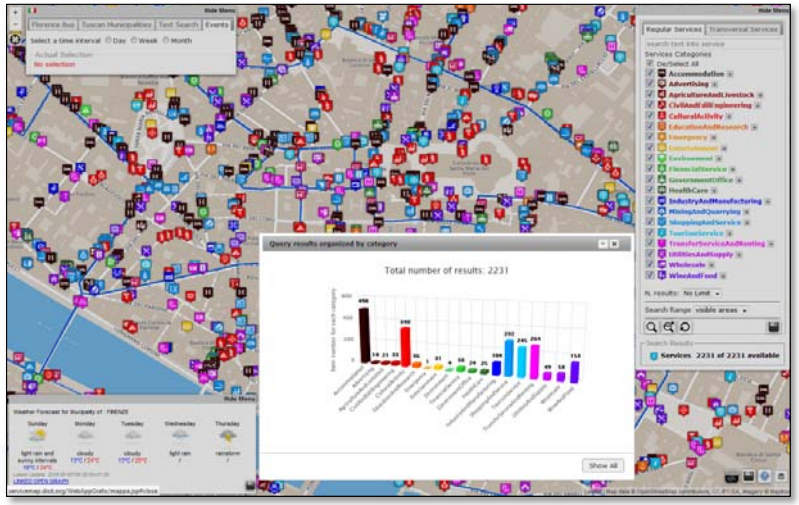


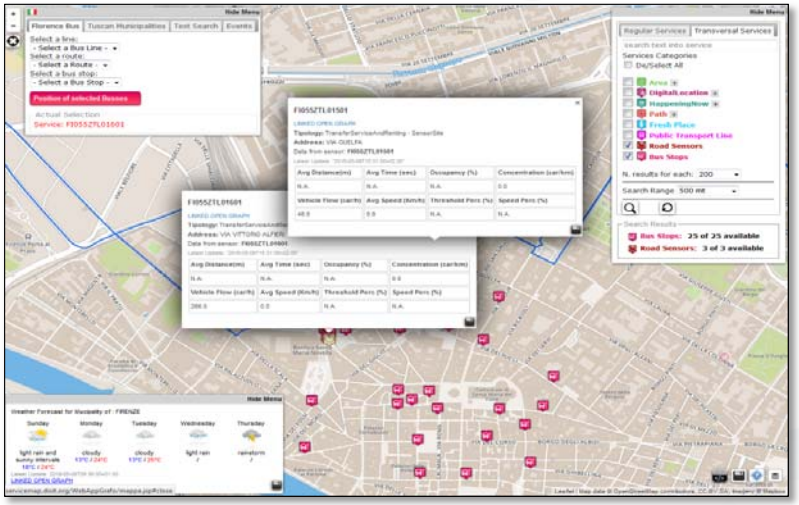

- Nascondi Menu
Fermate Firenze
Comuni in Toscana
Ricerca Testuale
Seleziona una provincia:
FIRENZE
Seleziona un comune:
FIRENZE
Actual Selection
COMUNE di FIRENZE
Present data
Tuscany Region
Road Graph (Tuscany region)
132,923 Roads
389,711 Road Elements
318,160 Road Nodes
1,508,207 Street Numbers
Services (20 cat, 512 cat.)
16 Pub. Transport Operators
21.280 Bus stops & 1081 bus lines
210 Parking areas
796 Traffic Sensors
Info on: points, paths, areas, etc.
Dynamic/real-time
• bus lines: 144 updates X day X line
• NEW: Timeline PT: 1081 lines, 1-2 updates per day
• parking status: 76 updates X day X sensor
• traffic Sensors: 288 updates X day X sensor
• weather: 2 updates X day for 285 areas
• NEW: Triage status: 96 updates per day, per hospital
• NEW: Fuel stations: 1 update per day, 1600 stations
• events: about 60 new events X day
• Wi-Fi: > 350.000 measures X day
• mobiles: > 50.000 measures X day
• more than 35.000 distinct users X day
• From 600.000 to 4.5 M Tweets X day
• ……+ many IOT are coming ……
- Nascondi Menu
Previsioni Meteo per il comune di FIRENZE:
Martedi
poco nuvoloso
23°C / 27°C
Mercoledi
pioggia debole e schiarite
Giovedi
poco nuvoloso
20°C / 33°C
Venerdi
poco nuvoloso
/
Sabato
velato
/
http://servicemap.km4city.org
- Nascondi Menu
Servizi Regolari
Servizi Trasversali
search text into service
Categorie Servizi
De/Select All
Accommodation
Advertising
AgricultureAndLivestock
CivilAndEdilEngineering
CulturalActivity
EducationAndResearch
Emergency
Entertainment
Environment
FinancialService
GovernmentOffice
HealthCare
IndustryAndManufacturing
MiningAndQuarrying
ShoppingAndService
TourismService
TransferServiceAndRenting
UtilitiesAndSupply
Wholesale
WineAndFood
N. risultati: Nessun Limite
Raggio ricerca 100 metri
Risultati della ricerca
più di 4000 risultati, attivato clustering
Services 16858
Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

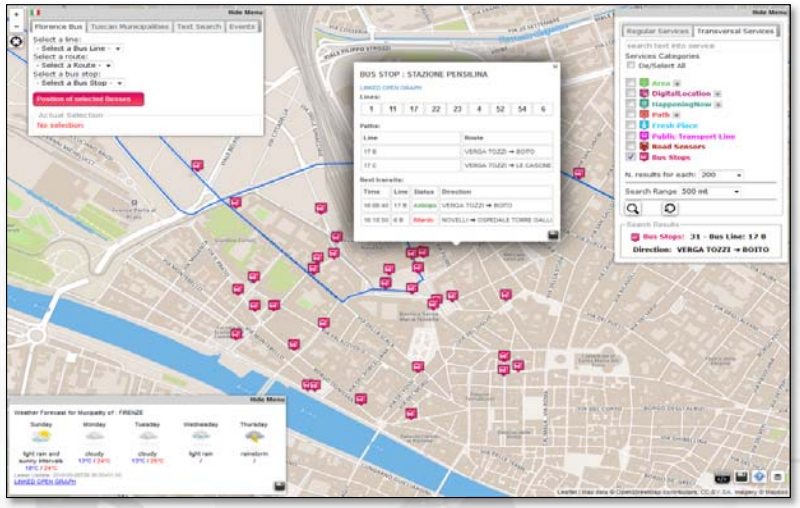

- Hide Menu
Florence Bus
Tuscan Municipalities
Text Search
Events
Select a province:
FIRENZE
Select a municipality:
FIRENZE
Actual Selection
Coord: 43.8066,11.2916
Address: VIA FRA' GIOVANNI DA FIESOLE DETTO IL BEATO ANGELICO, 5, FIESOLE
Tourist_trail: Firenze Card (dist:0,0004)
- Hide Menu
Regular Services
Transversal Services
Services Categories
De/Select All
Accommodation
Advertising
AgricultureAndLivestock
CivilAndEdilEngineering
CulturalActivity
EducationAndResearch
Emergency
Entertainment
Environment
FinancialService
GovernmentOffice
HealthCare
IndustryAndManufacturing
MiningAndQuarrying
ShoppingAndService
TourismService
TransferServiceAndRenting
UtilitiesAndSupply
Wholesale
WineAndFood
Filter:
search text into service
N. results: No Limit
Search Range 5 km
Search Area select...
Search Results
more than 4000 results, clustering enabled
Services 21465 of 21465 available
+ Show Menu
Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery ©

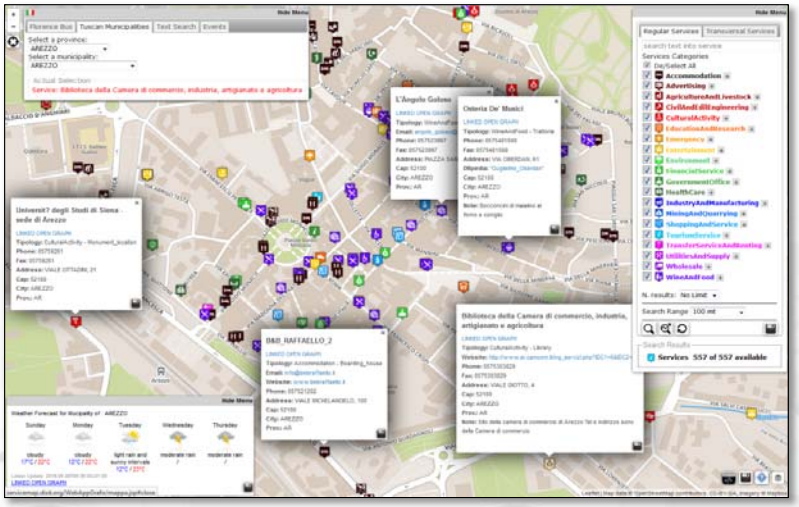
UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB
http://www.disit.org

ServiceMap







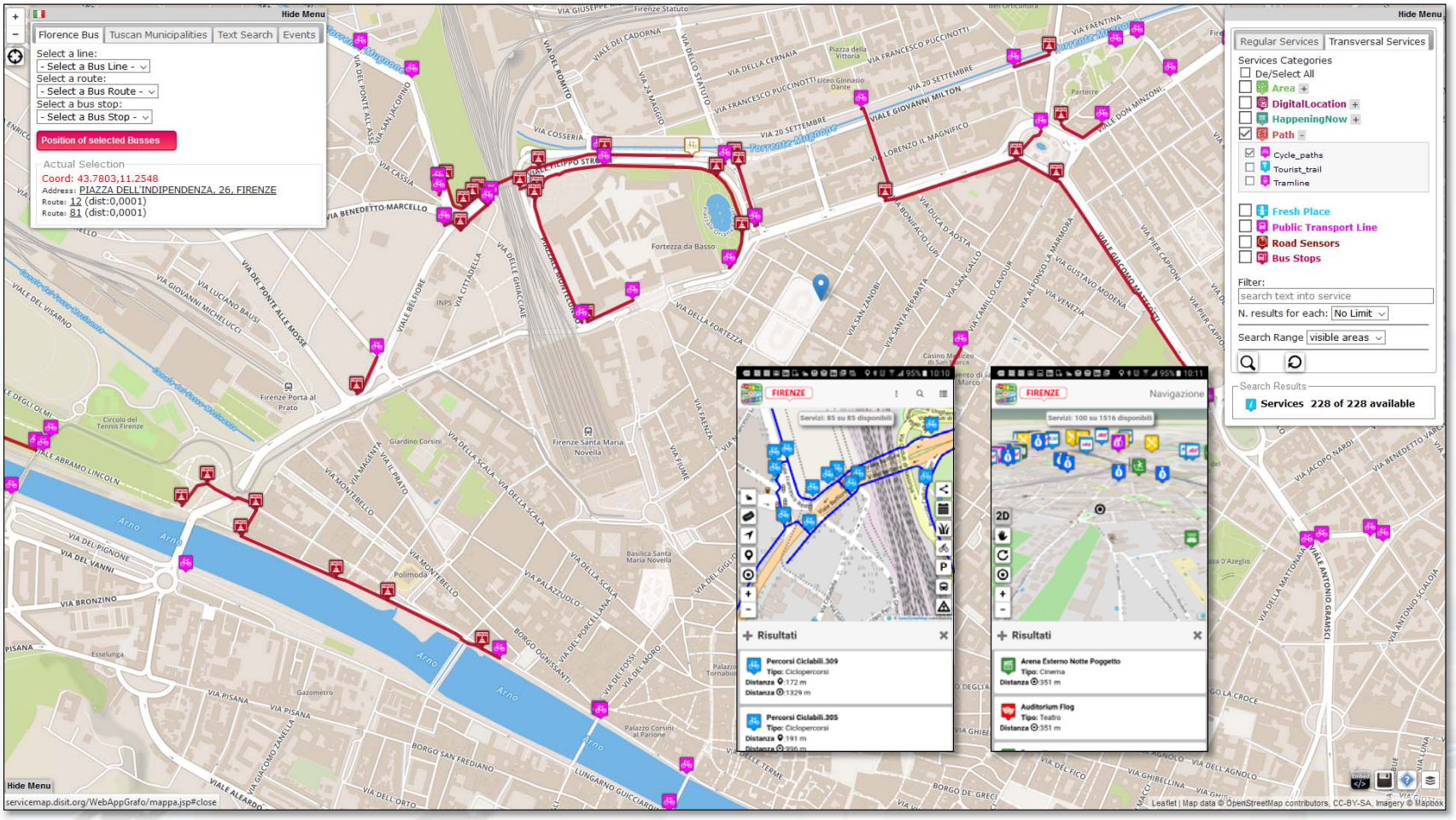


DISIT lab, Sii-Mobility, Km4City, January 2017

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB
http://www.disit.org

Cycling Paths

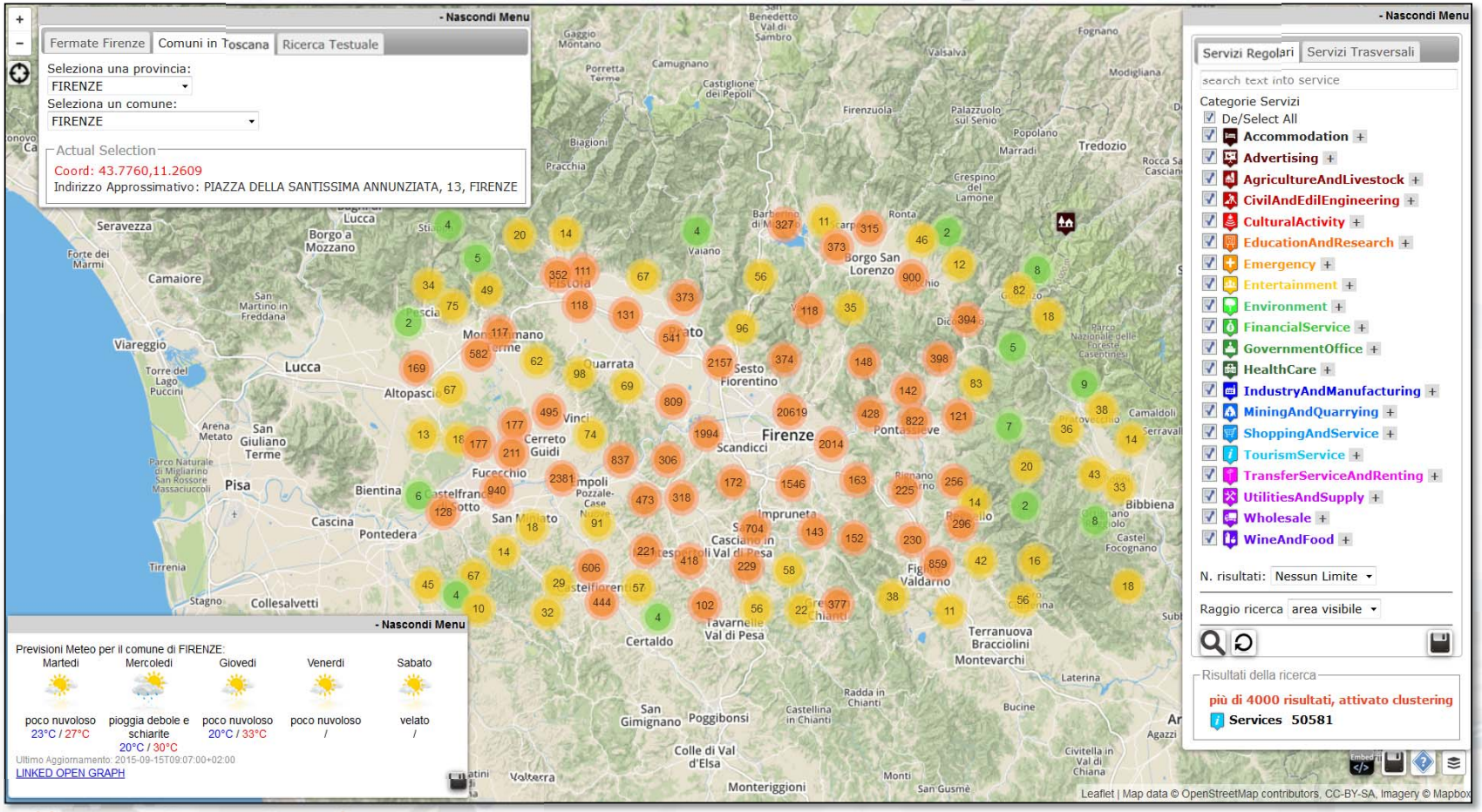
Sii-Mobility



UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB http://www.disit.org

Sii-Mobility

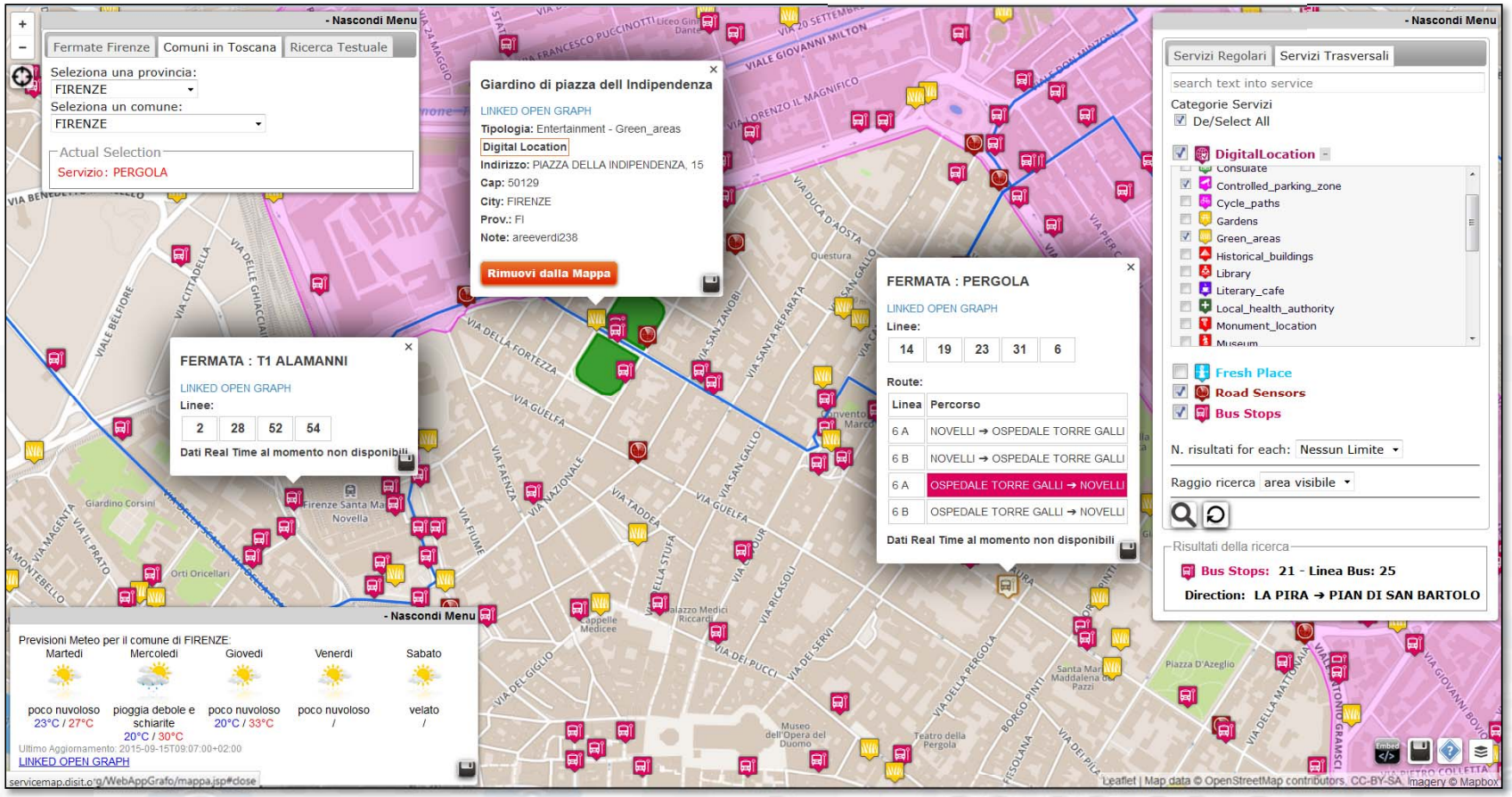
Firenze and beyond



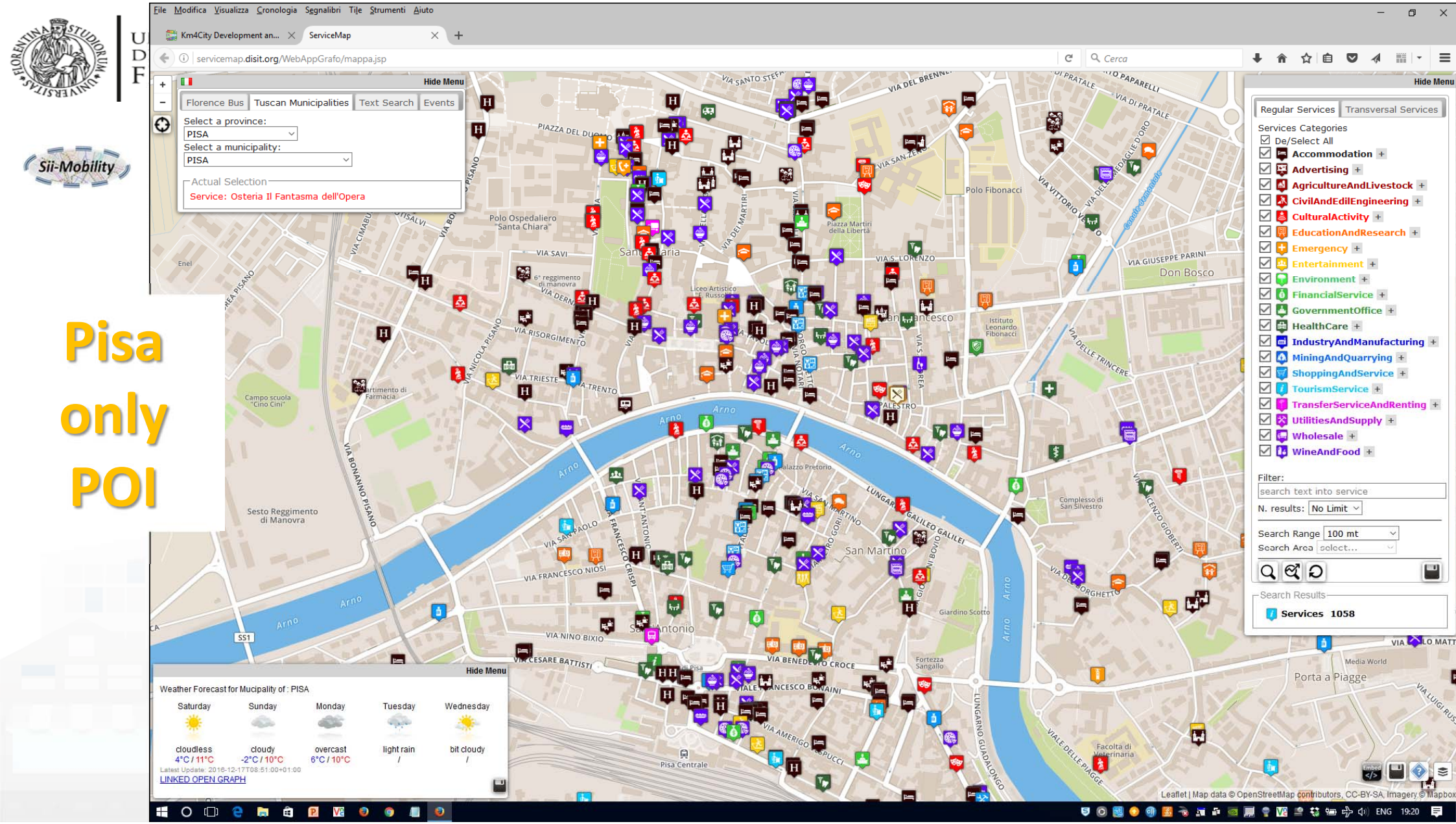
- **Search all services in the area**

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB
http://www.disit.org

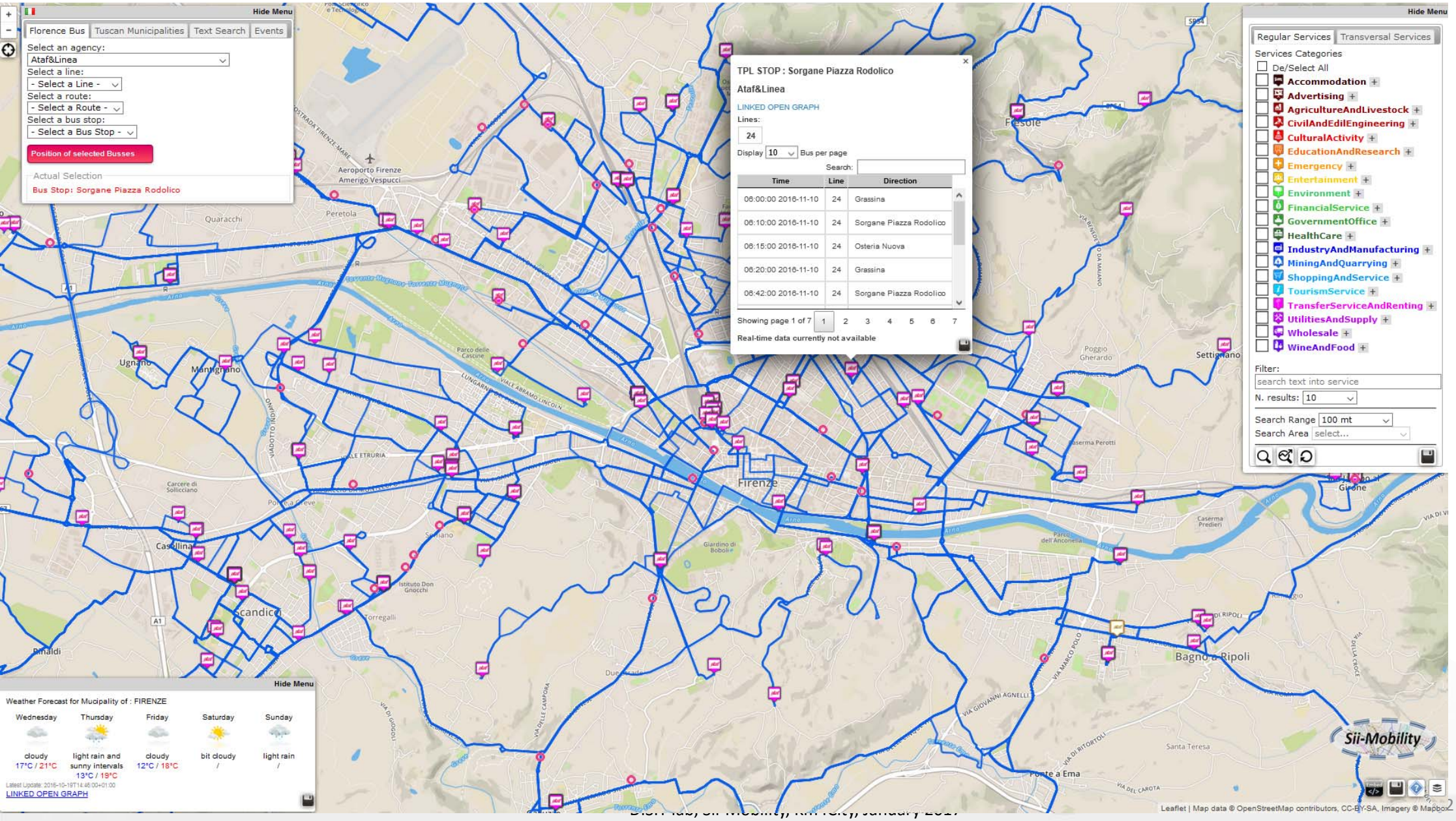
Firenze



- **Areas, Bus lines, bike lanes, tram, RTZ, etc.**



Pisa only POI


Hide Menu
Florence Bus
Tuscan Municipalities
Text Search
Events
Select an agency:
Ataf&Linea
Select a line:
- Select a Line -
Select a route:
- Select a Route -
Select a bus stop:
- Select a Bus Stop -
Position of selected Busses
Actual Selection
Bus Stop: Sorgane Piazza Rodolico
TPL STOP : Sorgane Piazza Rodolico
Ataf&Linea
LINKED OPEN GRAPH
Lines:
24
Display 10 Bus per page
Search:
Time
Line
Direction
06:00:00 2016-11-10 24 Grassina
06:10:00 2016-11-10 24 Sorgane Piazza Rodolico
06:15:00 2016-11-10 24 Osteria Nuova
06:20:00 2016-11-10 24 Grassina
06:42:00 2016-11-10 24 Sorgane Piazza Rodolico
Showing page 1 of 7
1 2 3 4 5 6 7
Real-time data currently not available
Hide Menu
Regular Services
Transversal Services
Services Categories
De/Select All
Accommodation
Advertising
AgricultureAndLivestock
CivilAndEdilEngineering
CulturalActivity
EducationAndResearch
Emergency
Entertainment
Environment
FinancialService
GovernmentOffice
HealthCare
IndustryAndManufacturing
MiningAndQuarrying
ShoppingAndService
TourismService
TransferServiceAndRenting
UtilitiesAndSupply
Wholesale
WineAndFood
Filter:
search text into service
N. results: 10
Search Range 100 mt
Search Area select...
Hide Menu
Weather Forecast for Mucipality of : FIRENZE
Wednesday
Thursday
Friday
Saturday
Sunday
cloudy
17°C / 21°C
light rain and sunny intervals
13°C / 19°C
cloudy
12°C / 18°C
bit cloudy
/
light rain
/
LINKED OPEN GRAPH
Firenze
Sii-Mobility
Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

Other Sensors and Actuators, IOT

- Restricted Traffic Zone Gates
  - Passages, payment, alerts,
  - Wi-Fi control, RFI control, etc.
- Road Direction manager: panel, red-light, etc.
  - Status and action
- Environmental Sensors:
  - Air quality, pollution, rain, allergens, temperature,
  - humidity,…
- Public Light Pillar
  - Traffic flows, environment,
  - Wi-Fi, Tv-Camera, BT servers, on/off, percentage of light, ..
- Waste Manager
  - Level, kind, status, on/off
- Recharge station, column
  - Free slots, consumption, next time slot, …

- **Environmental Sensors**:
  - Air, temperature, humidity,
  - water level in rivers
  - Status of underpass and bridges
- **Risk assessment**
  - Value of the buildings,
  - hydrogeological risk map,
  - earthquake risk map, …
  - people distribution and location
  - Position of recover places,
- **Traffic Zone Gates**
  - Passages, alerts,
  - etc.

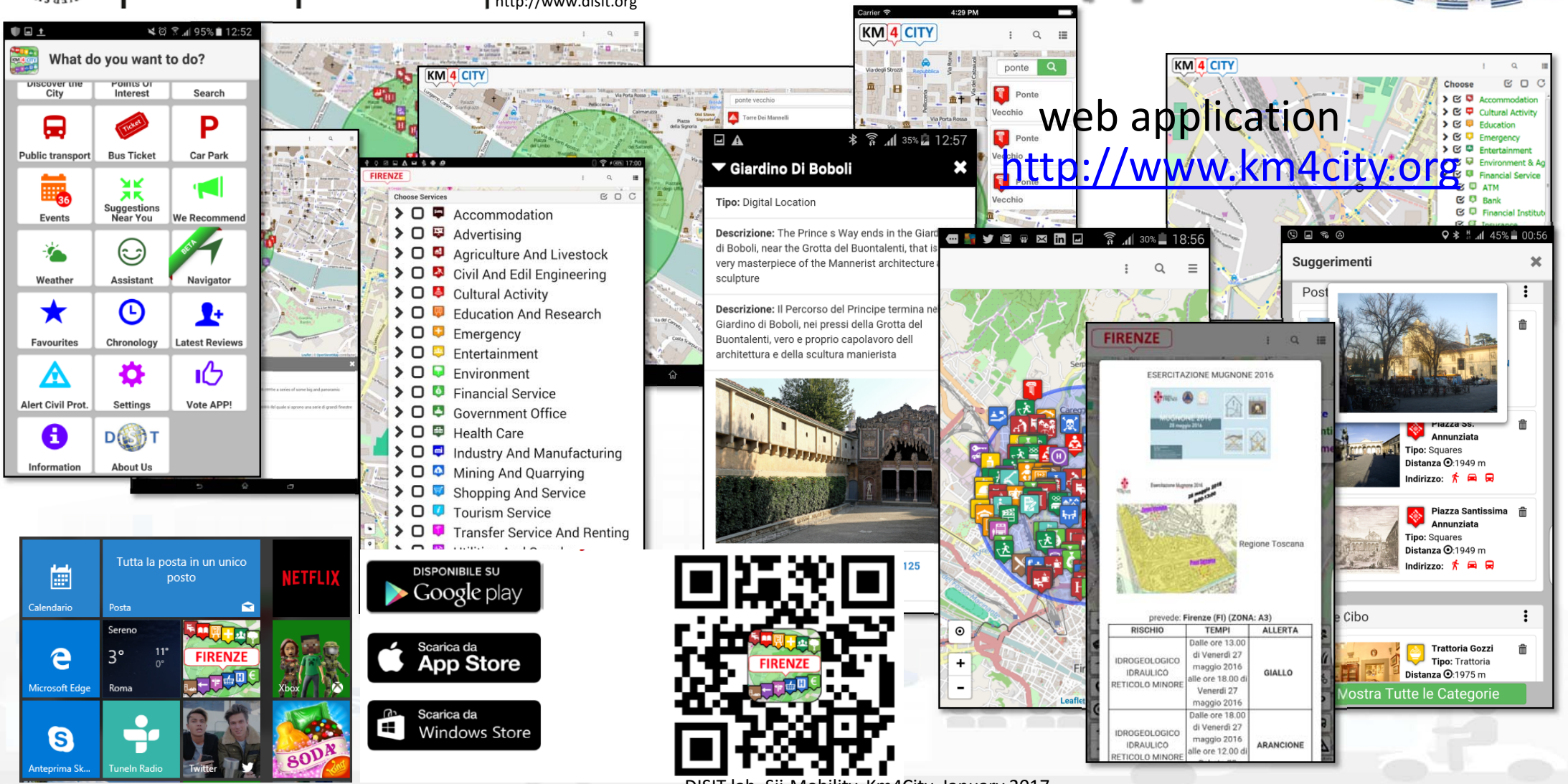
Engaging Users via Apps

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB
http://www.disit.org

Mobile App

Sii-Mobility

web application
http://www.km4city.org

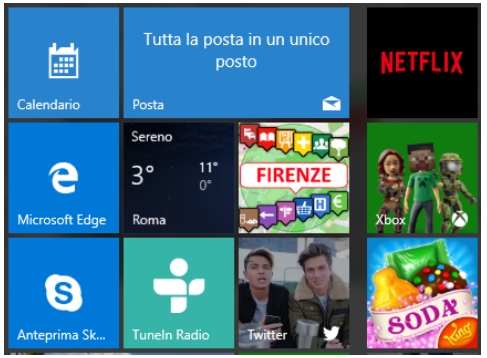


UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB
http://www.disit.org

Mobile and Web App

Get it on Google play
Download on the App Store
Download from Windows Store

Available on the App Store
ANDROID APP ON Google play
Download from Windows Phone Store



- https://www.microsoft.com/en-us/store/p/firenze-dove-cosa-km4city/9nblggh5xx4v
- https://www.microsoft.com/en-us/store/p/toscana-dove-cosa-km4city/9nblggh6jdnd

HTML

HTML5 version

– http://www.km4city.org/webapp/

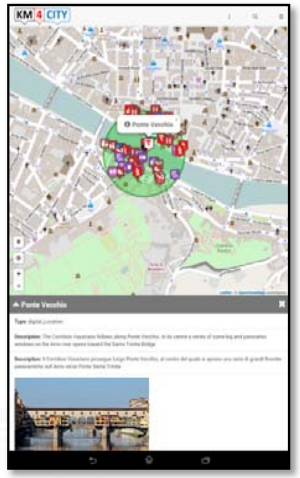
Mobile APP, features 1/3

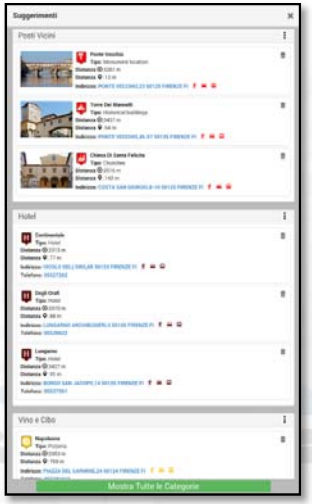
- **5 languages:** IT, EN, SP, DE, FR
- **Profiles** city users: Citizens, commuter, student, tourist, operator, etc..
- **Profiled Menu** per POI
  - adaptive
- **Main Menu: dynamic, and personalized**
- **Search Text**
- Search per POI
  - Near to you, near to a point, line...
- Other search
  - Close to you, events green areas, public transport, tickets , Cycling, parking, ….
  - Etc.
- POI
  - Preferred, Social icon
  - Ranking, Comments, images

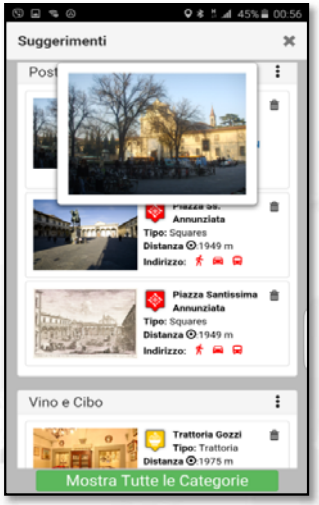
Available on the App Store

ANDROID APP ON Google play

Download from Windows Phone Store

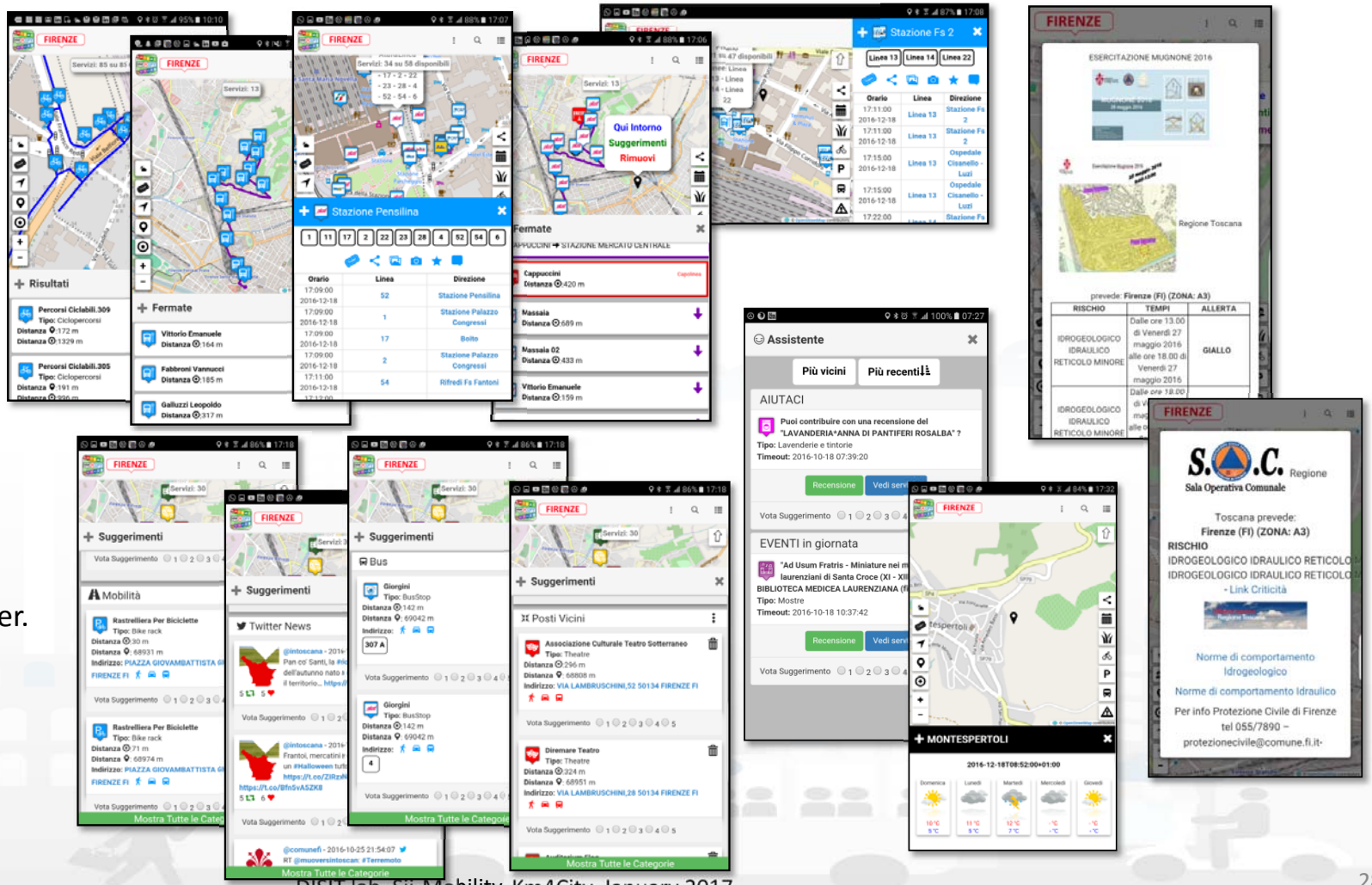






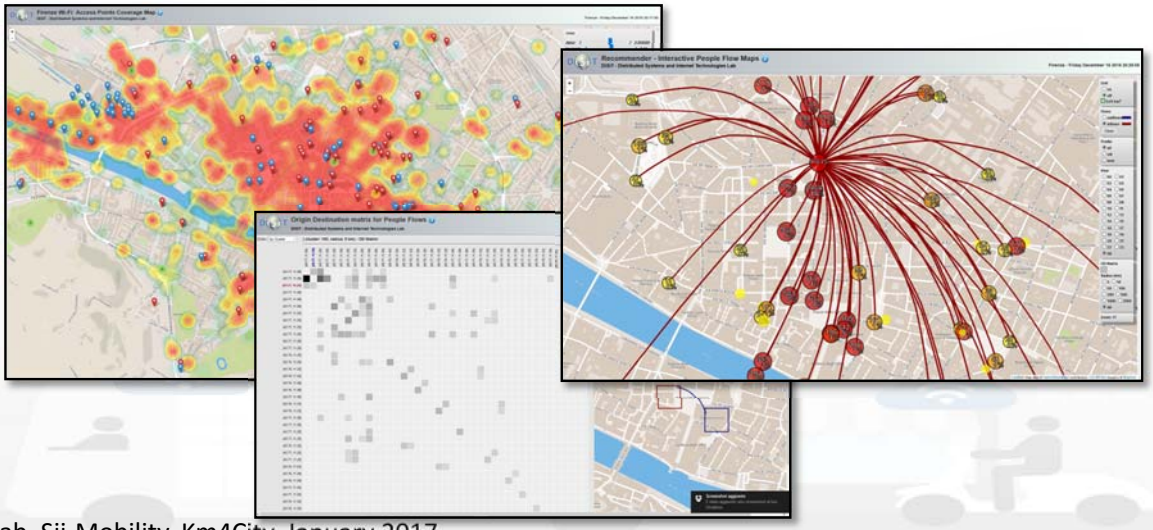
Mobile APP, features 2/3

- **Mobility**
  - Paths and stops, time
  - Parching + prediction
  - Tickets
  - Flow + prediction
- **Personal Assistant**
  - Info
  - Engagement
  - Help
  - Civil protection
- **Suggestions:**
  - Personalized and adaptive: banned e typed per city user.
  - POI, Twitter, Events,
  - Weather forecast,
  - Civil Protection
  - …



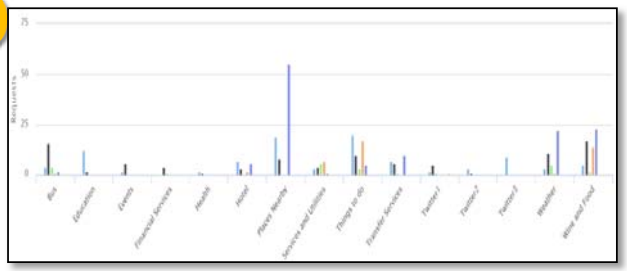
Mobile APP, features 3/3

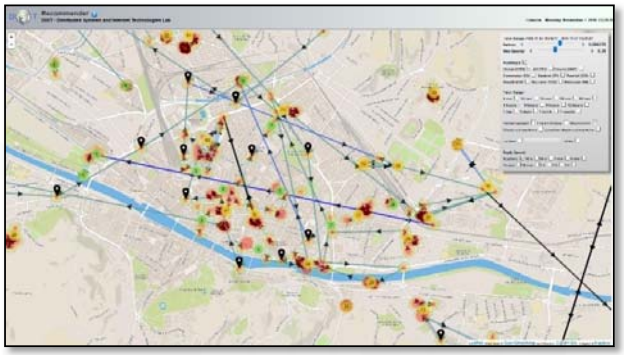
- **Navigation 3D (BETA)**
- **Ticketing for busses**
- **App used are tool for city assessment**
  - Wifi status
  - iBeacon status
  - User behavior analysis
    - GPS movements kinds
    - OD matrix
    - International flows

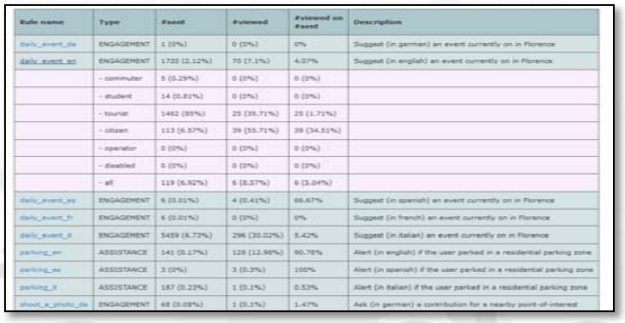


Reasoning on App Data and for App

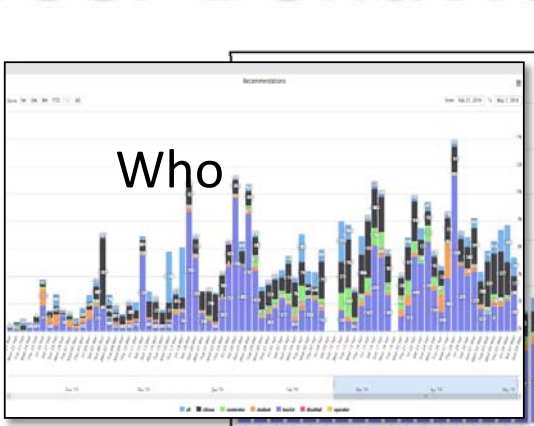
- **User behavior analysis**
  - engagement on demand
  - Reconstruction of user behavior on t he move and in the city in general
  - Pedestrian, TPL, Bike, private, etc.
- **Production of Engagements….**
- **Suggestions…**
- **Routing….**

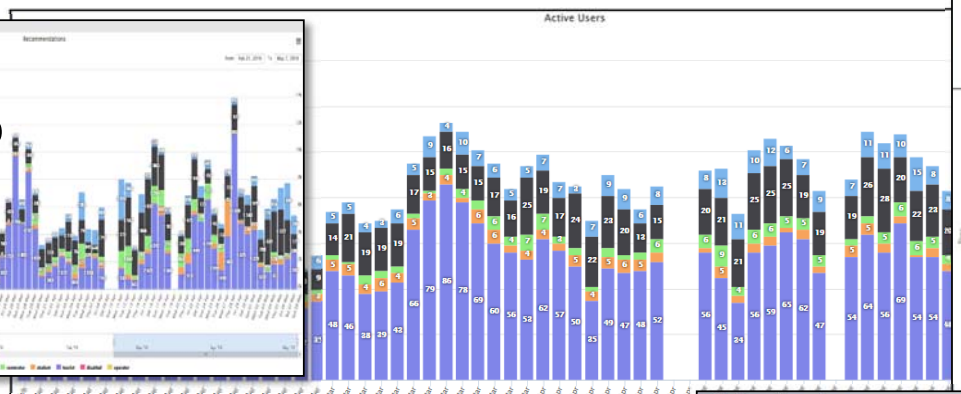


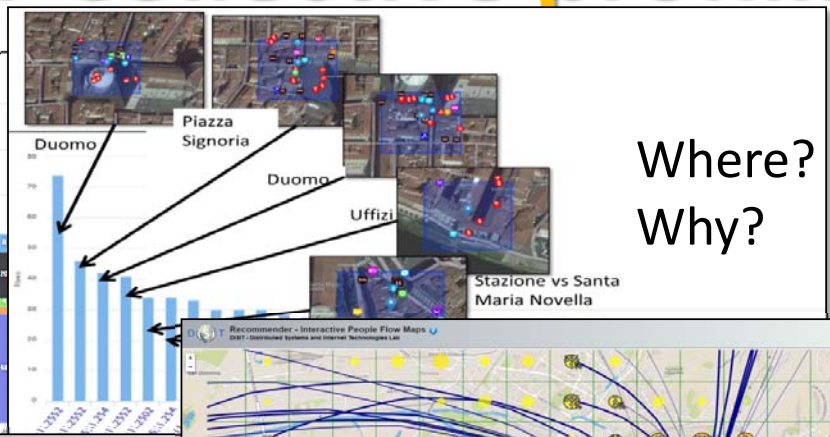


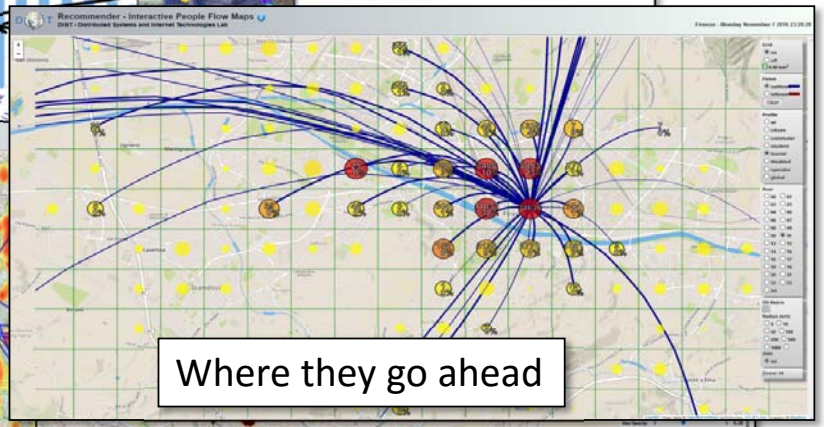


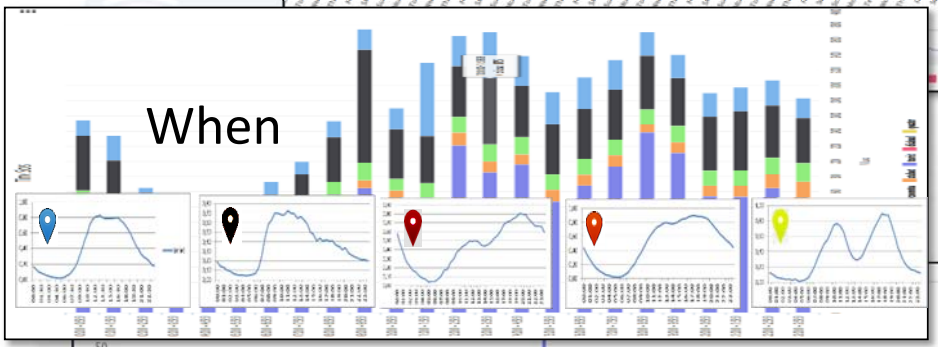
User Behavior Analyzer for Collective profiling

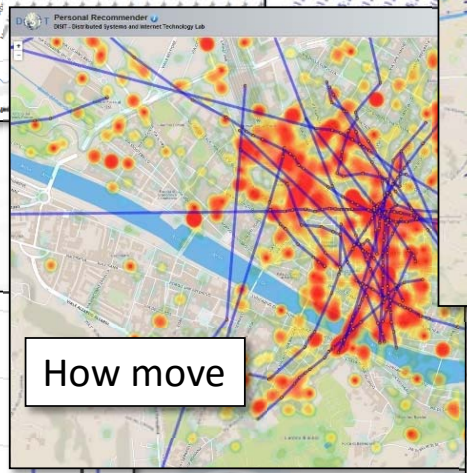


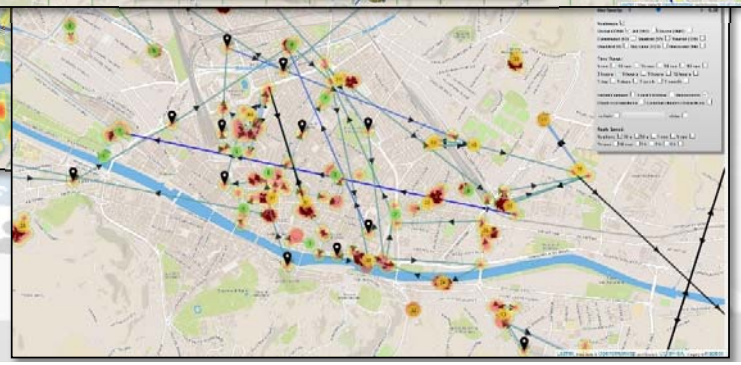


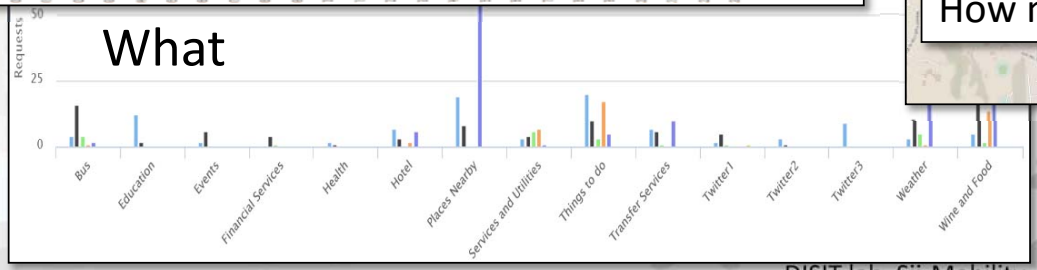








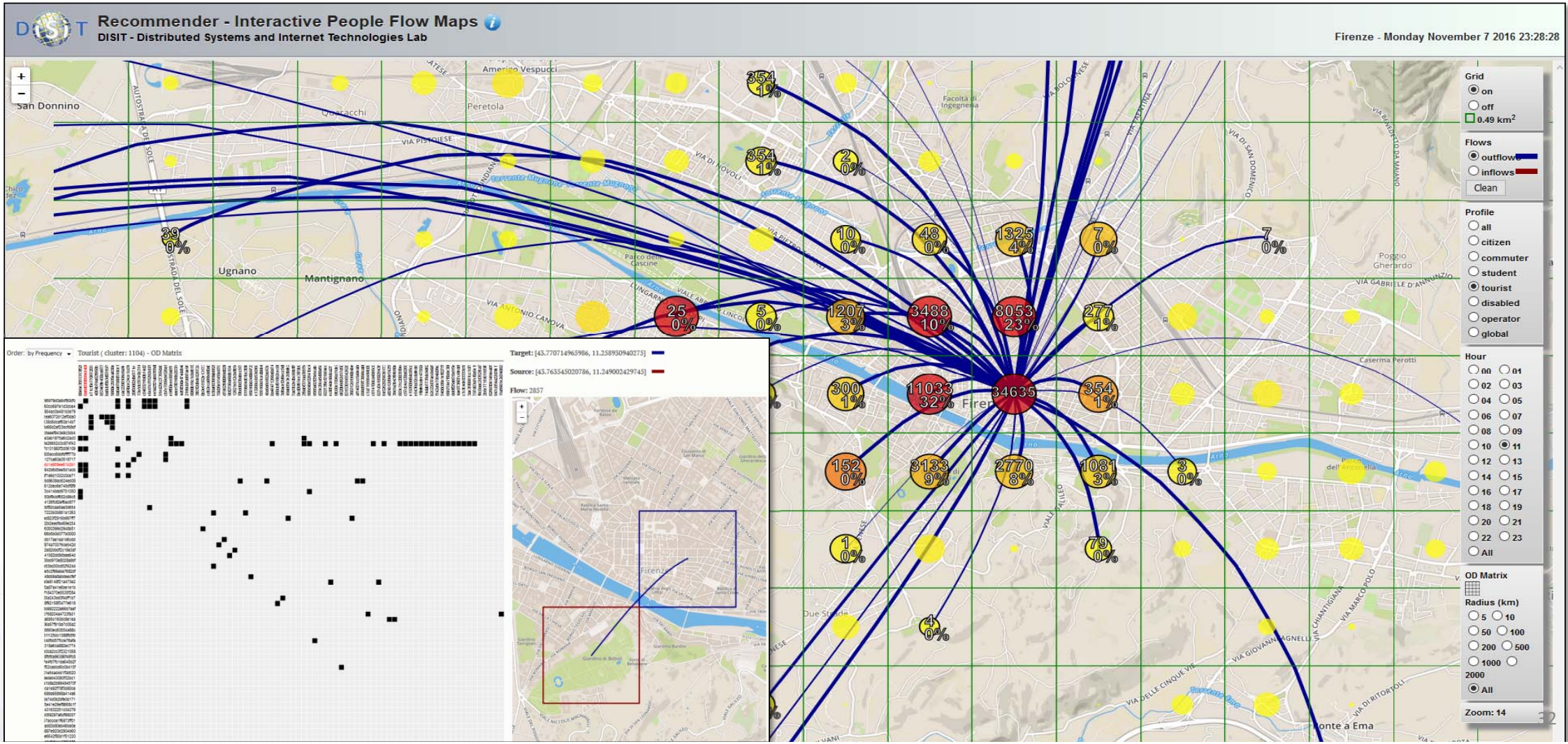




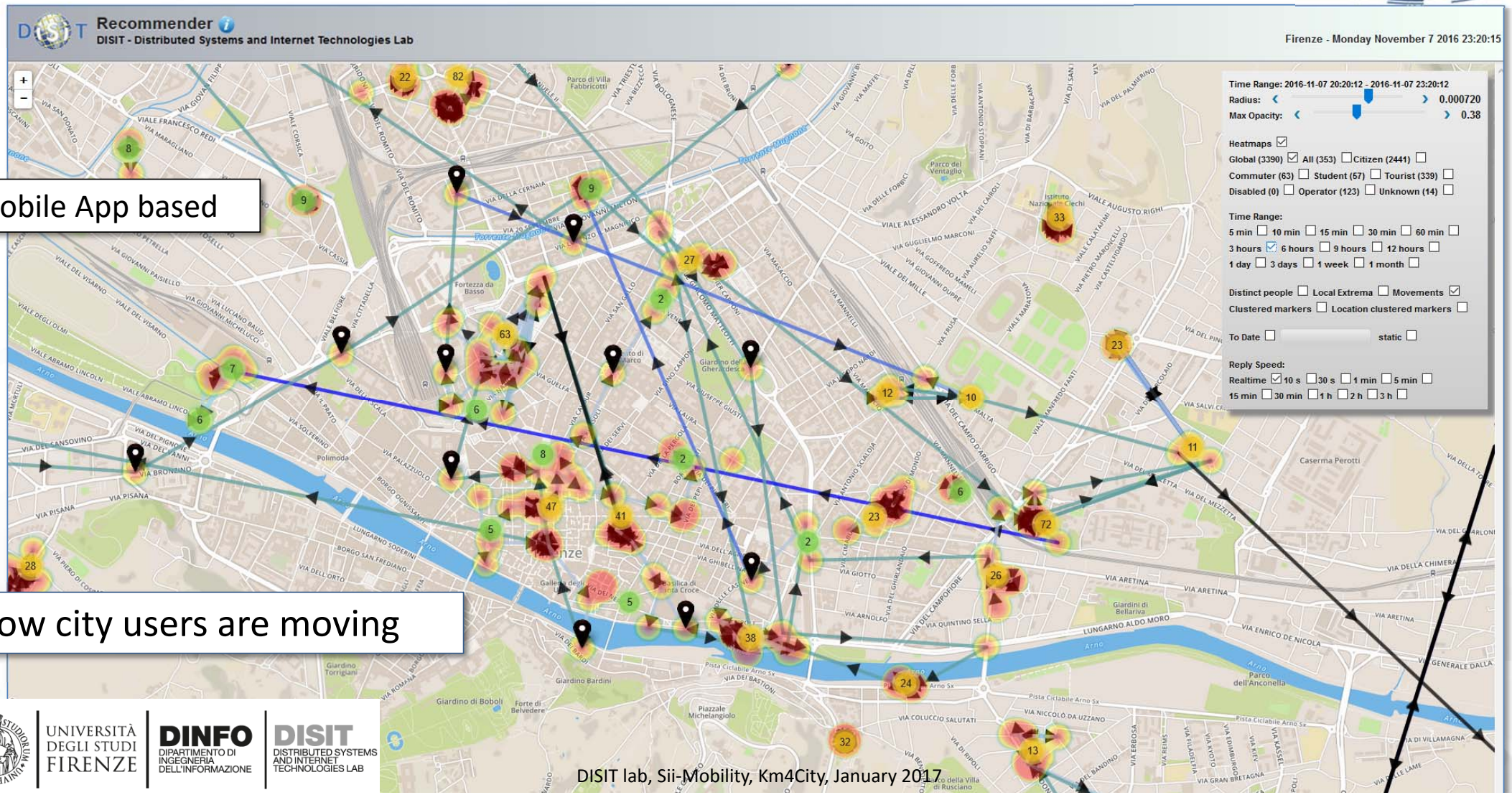
UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB
http://www.disit.org

OD Matrix scalabile

Sii-Mobility



Anonymous User Behavior Analysis



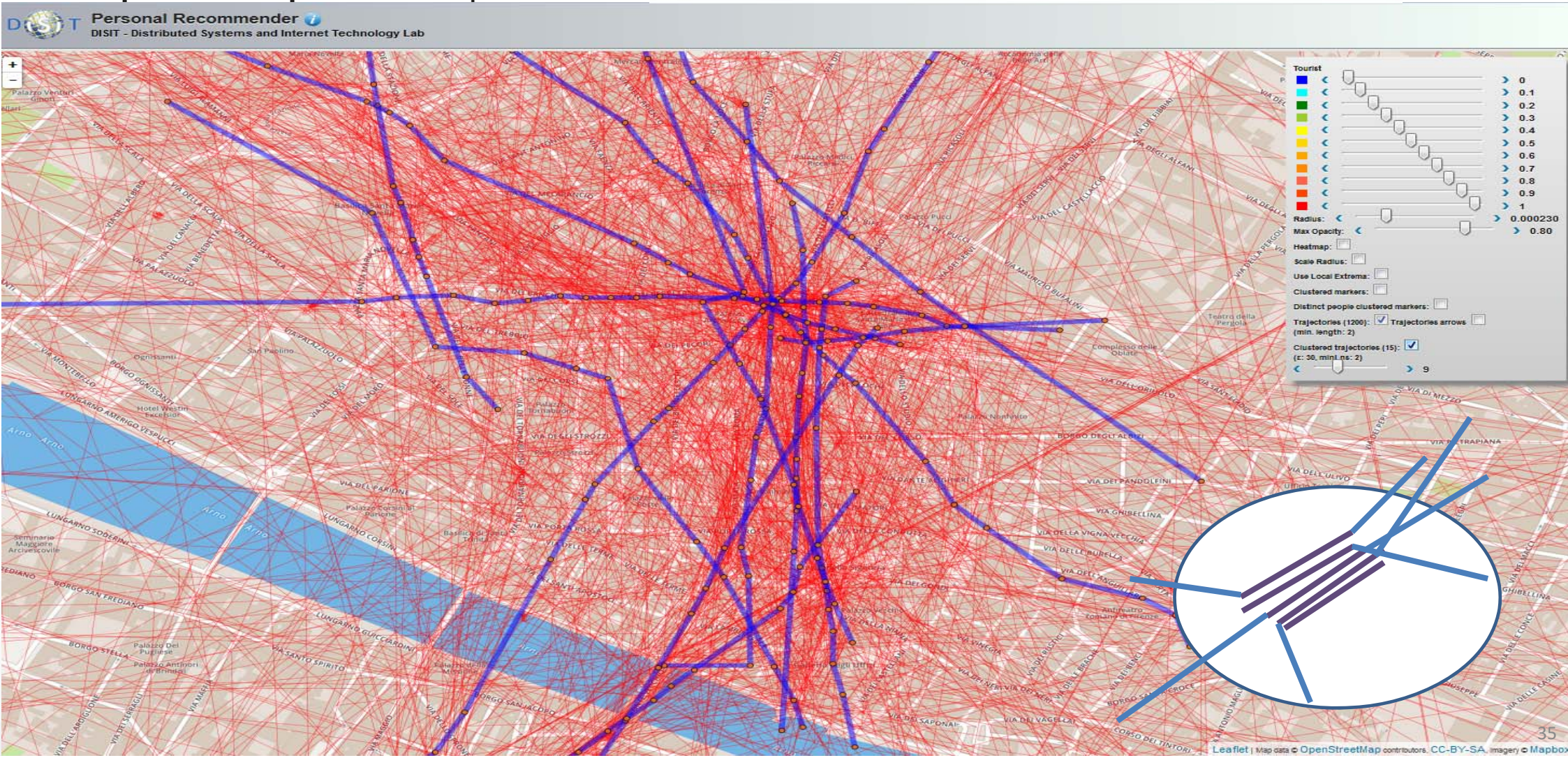
Mobile App based

How city users are moving

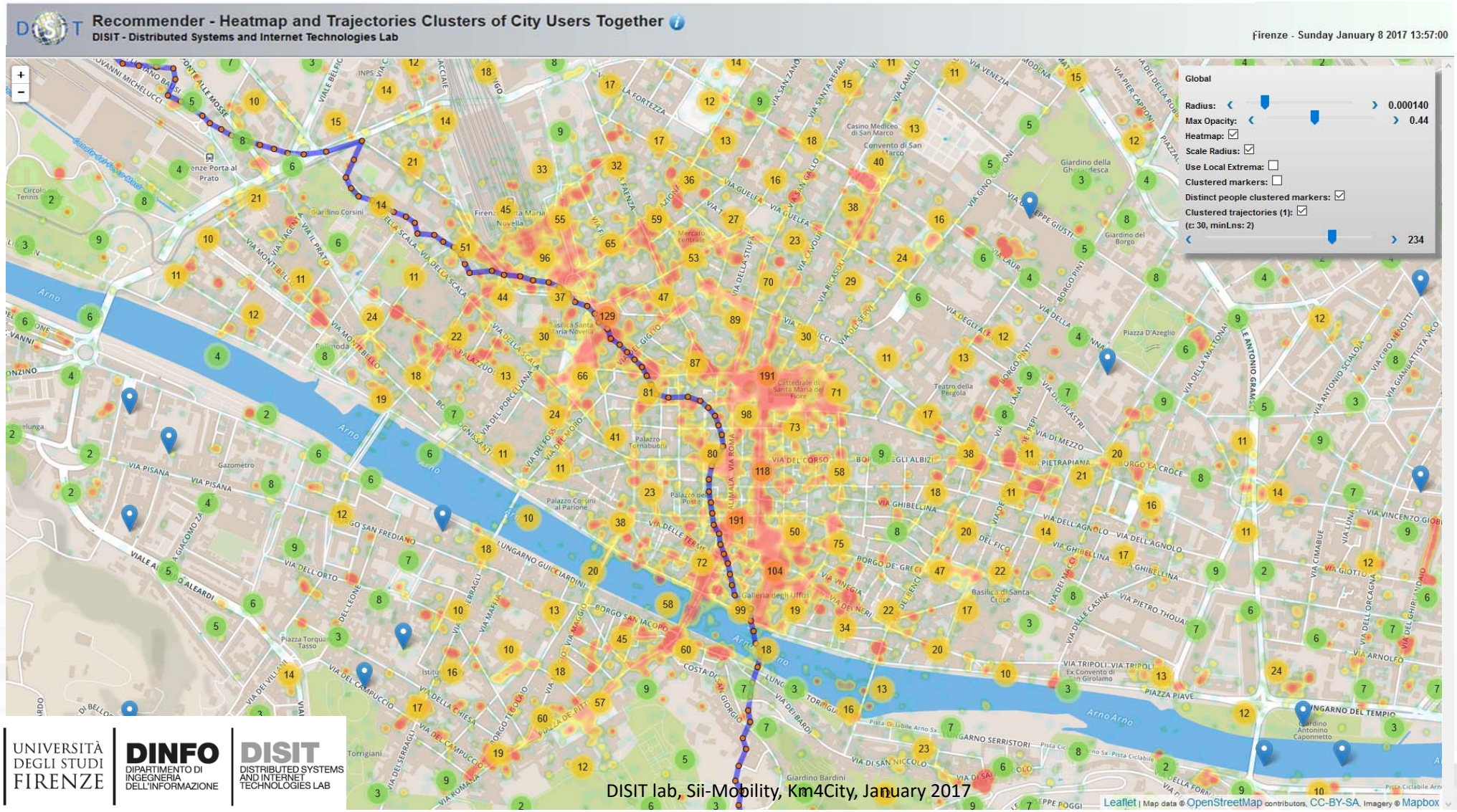
UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB

Cluster di Trajectories

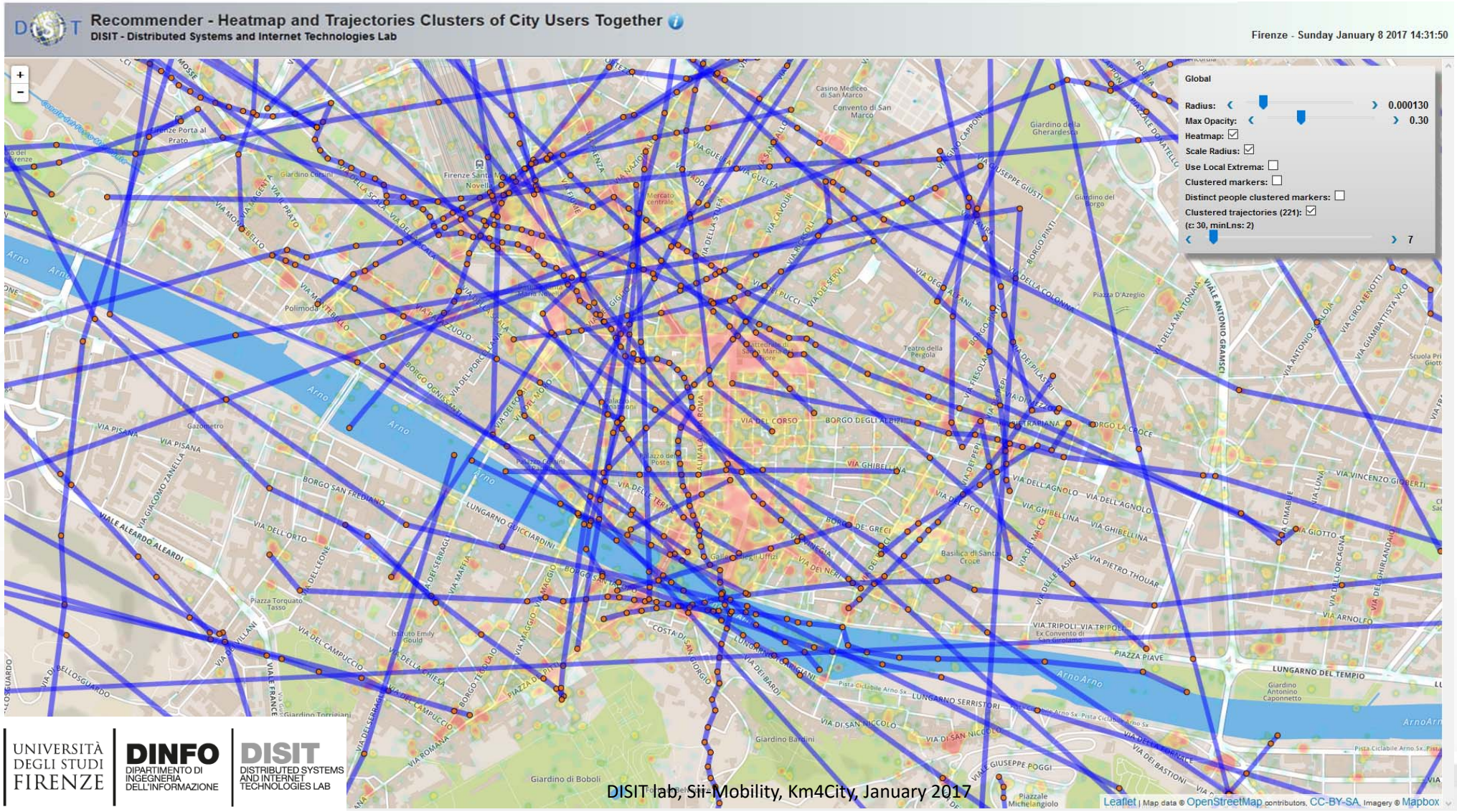
Sii-Mobility



Heat Map from Mobile: users as sensors

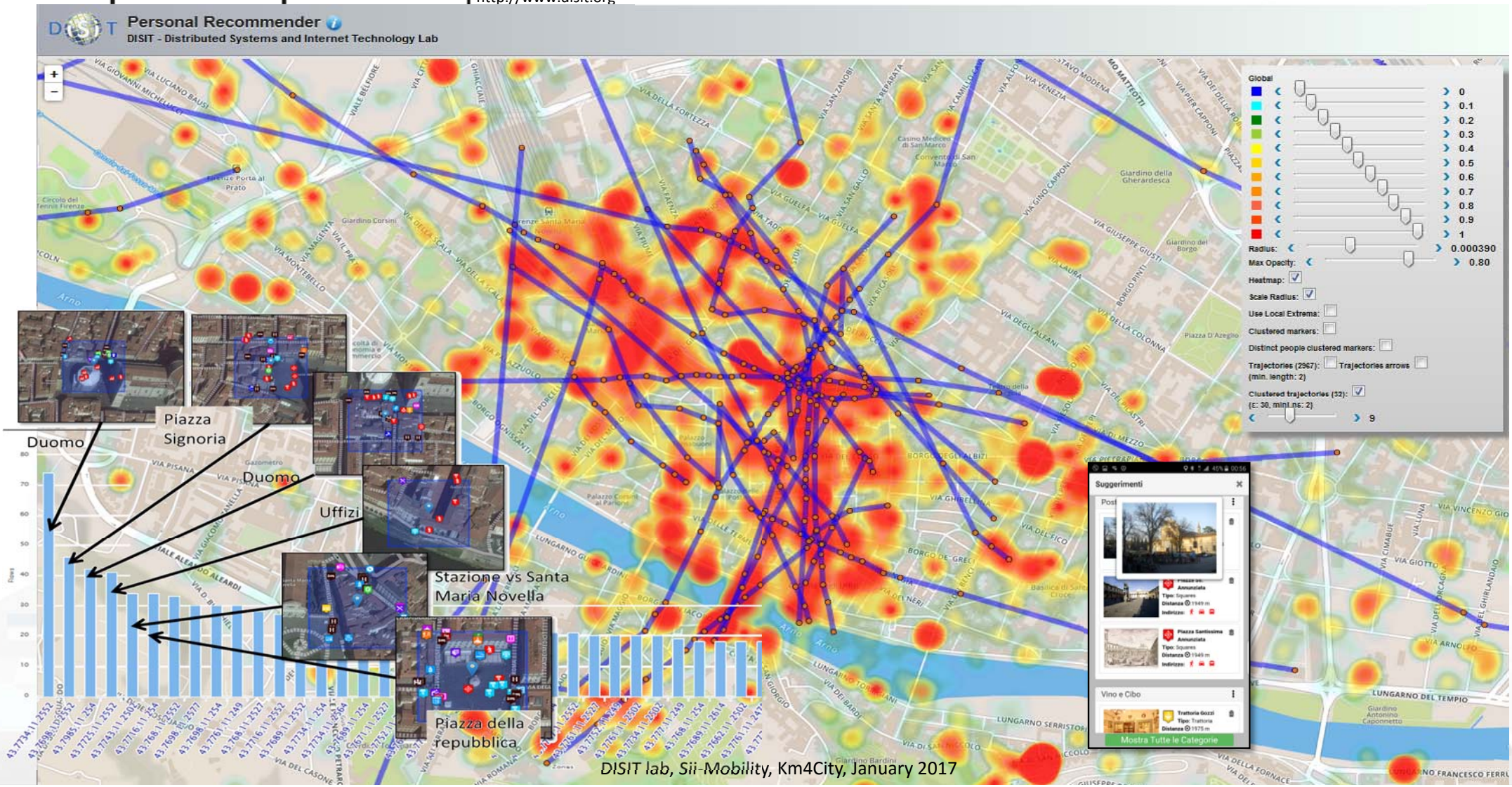


Heat Map from Mobile: users as sensors



UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB
http://www.disit.org

User Behavior Analyzer



Strategies Implementation via Engagement

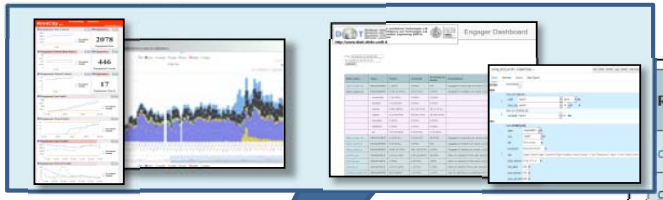
- **Produce value from data enabling** to
  - ***Stimulate virtuous behavior,***
  - ***influence engage City Users!***
  - Increase efficiency in energy consumption
  - Reduce pollution and traffic congestion
  - Improve quality of service, quality of life
- **Create an ecosystem for innovation** and put in action any smart city solutions and services.

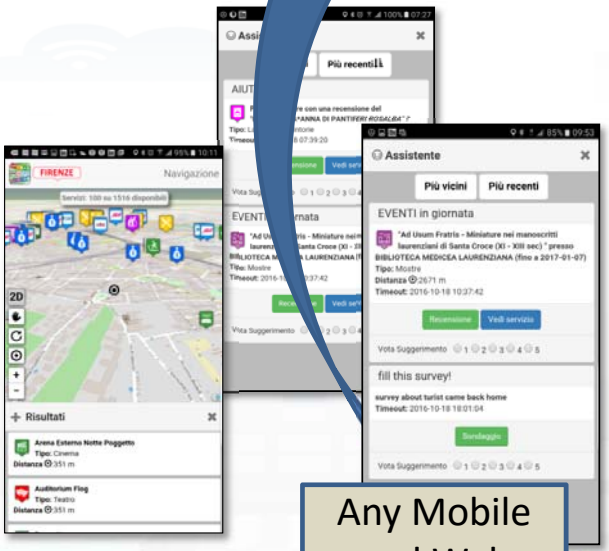
Suggestion on demand service

- Personalized menu on the basis of User Category
- **Automated Suggestions personalized**:
  - taking into account user profile and behavior, dislikes, requests, queries, etc.
- **Engagement**
  - Engine and Rule Editor
- **Advertising**
  - Engine and Rule Editor

User influencing, engaging, monitoring & Follow Up

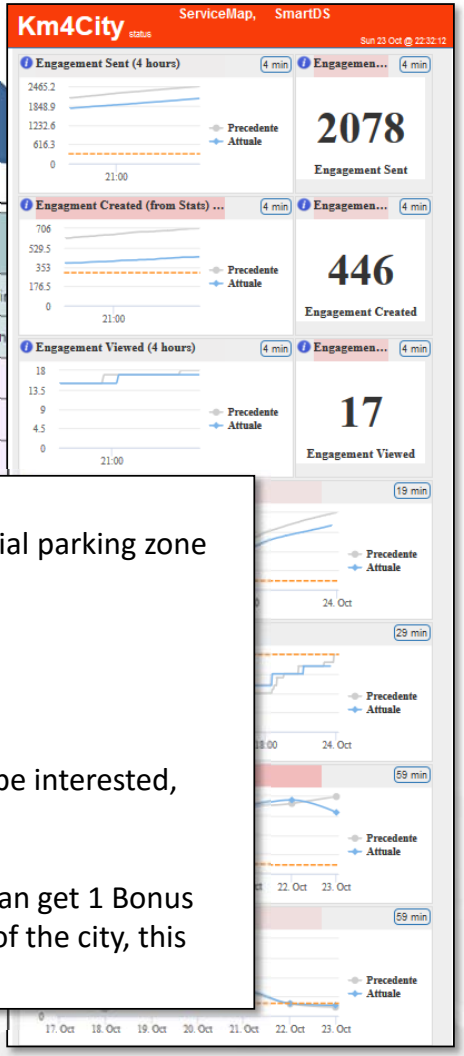
City & City Operators Strategy Editor





Any Mobile and Web App

Rule name	Type	#sent	#viewed	#viewed on #sent	Description
daily_event_de	ENGAGEMENT	1 (0%)	0 (0%)	0%	Suggest (in german) an event currently on i
daily_event_en	ENGAGEMENT	1720 (2.12%)	70 (7.1%)	4.07%	Suggest (in english) an event currently on in
	- commuter	5 (0.29%)	0 (0%)	0 (0%)	
	- student	14 (0.81%)	0 (0%)	0 (0%)	
	- tourist	1462 (85%)	25 (35.71%)	25 (1.71%)	
	- citizen	113 (6.57%)			
	- operator	0 (0%)			
	- disabled	0 (0%)			
	- all	119 (6.92%)			
daily_event_es	ENGAGEMENT	6 (0.01%)			
daily_event_fr	ENGAGEMENT	6 (0.01%)			
daily_event_it	ENGAGEMENT	5459 (6.73%)			
parking_en	ASSISTANCE	141 (0.17%)			
parking_es	ASSISTANCE	3 (0%)			
parking_it	ASSISTANCE	187 (0.23%)			
shoot_a_photo_de	ENGAGEMENT	68 (0.08%)			



Inform

You have parked out of your residential parking zone
The Road cleaning is this night
The waste in S.Andreas Road is full

Engage

Provide a comment, a score, etc..

Stimulate / recommend

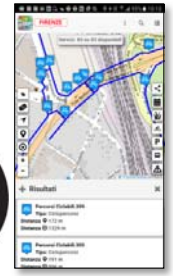
Events in the city, services your may be interested, etc..

Provide Bonus

Since you have parked here you we can get 1 Bonus
We suggest you to leave the car out of the city, this bonus can be used to by a bus ticket

Engagement & Assisstant Rules

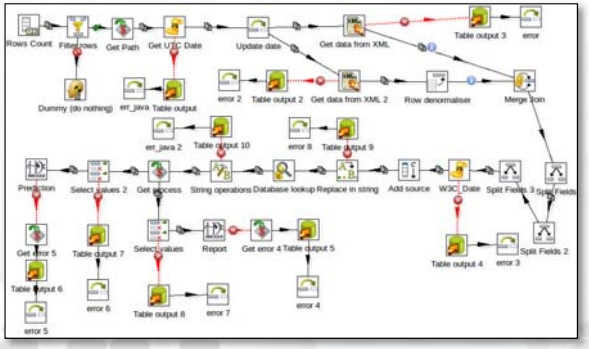
- **Detecting** city users' habits about mobility
  - Private cars → **stimulating Bus Usage & Bikes**
  - Private cars parking → usage of **peripheral parking-lot + bus**
  - Leave the car and take the bus twice → by using **bonus, tickets**..
  - ….. → different solutions for moving…
- **Assisting by notifying** when one is
  - parking out of the residential parking zone
  - parking in a zone subjected to cleaning in the next two days
  - entering in the restricted traffic zone
- **Suggesting** you about
  - Events, **Civil Protection Alerts**, …..
  - **Closer free parking** …
- **Administering** questionnaires
  - Getting assessment about services, city experience
  - ….
- **Requesting** ranking, photo and/or comments



Overview of Development tools for Apps

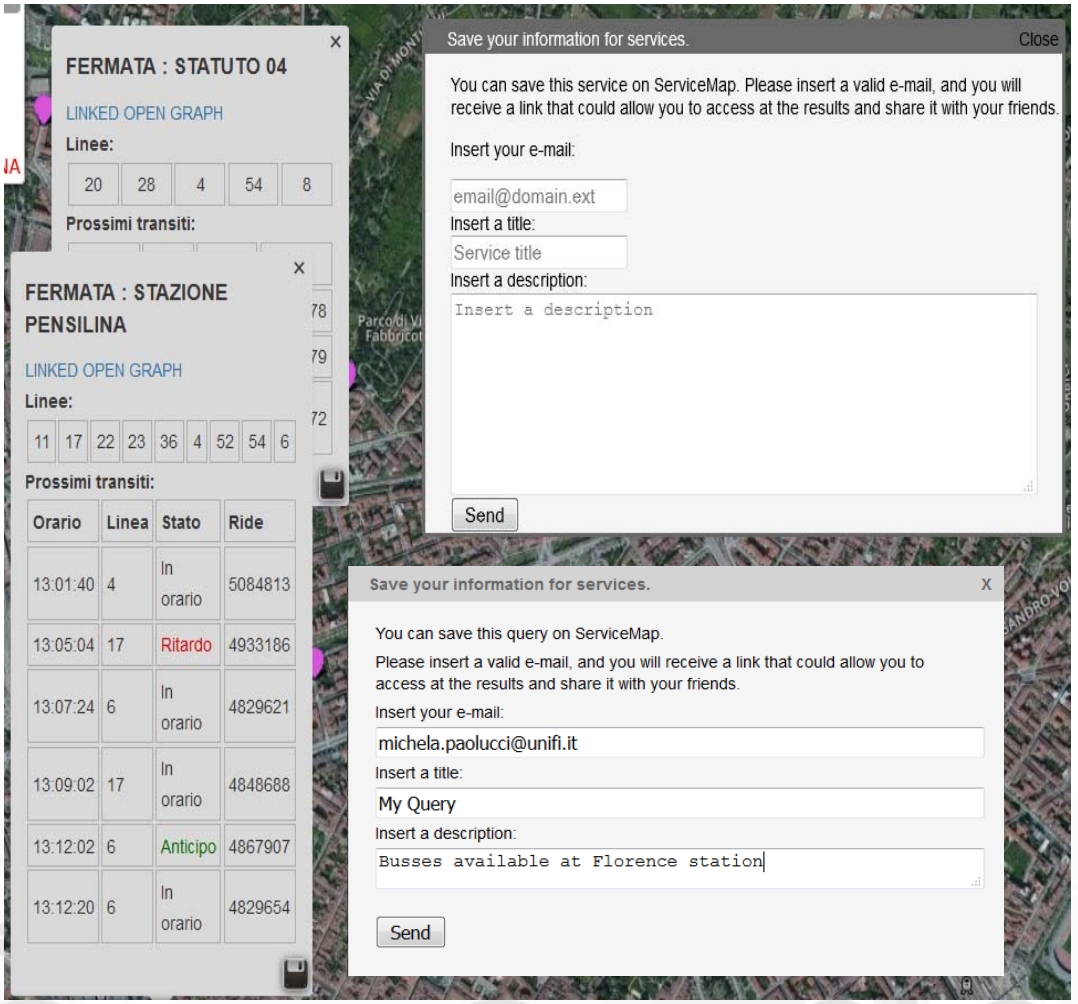
Development Tools

- **Smart City API:**
  - Several kind of APIs
- **Generator "ServiceMap", http://servicemap.km4city.org**
  - Call per web and mobile App
  - Embedding in web pages
- **Load new data: manual and automatic**
  - POI, IOT, etc.
  - Load of Shape & Paths

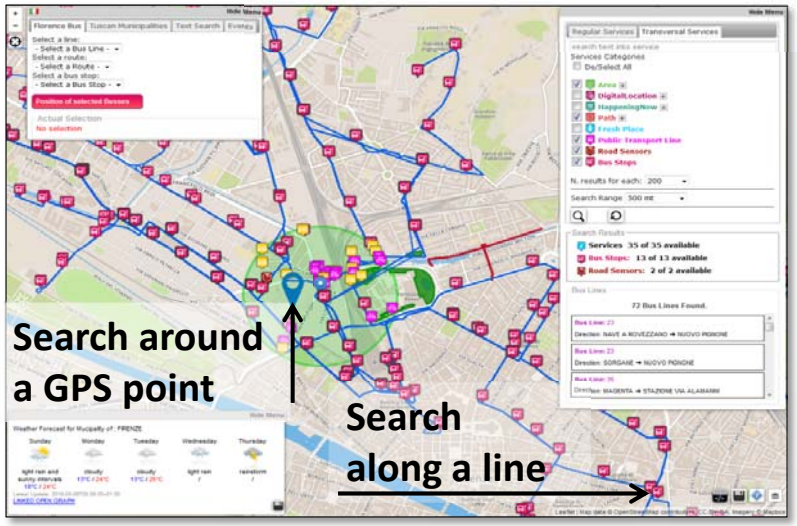


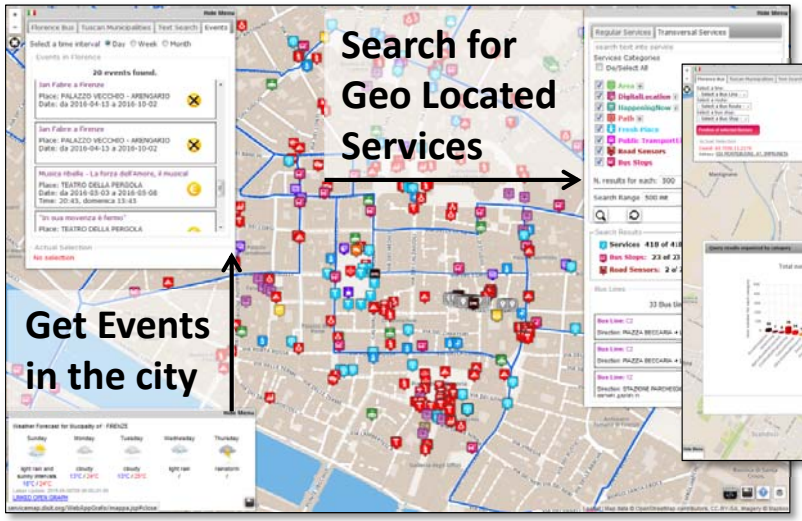
Smart City API

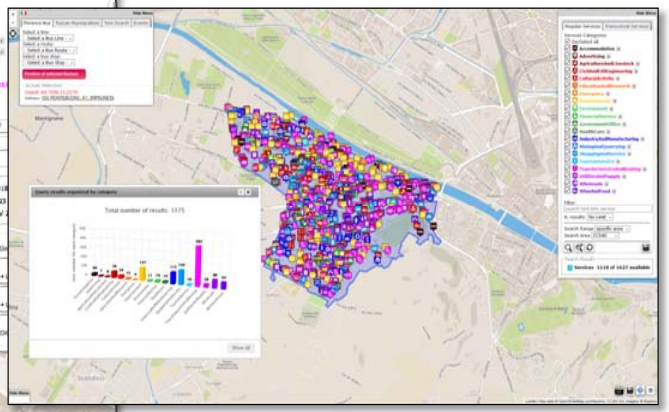
- http://www.disit.org/6597
  - REST API: serviceURI or Selection or GPS
  - REST API: Query ID
  - Receive an email
  - Get a JSON, HTML, …
  - Call SPARQL
- EMBED facility in third party web pages
- Developers may use the ServiceMap tool to:
  - compose geographical and textual queries
  - THEN request an e-mail containing the calls (same results in JSON and/or in HTML)

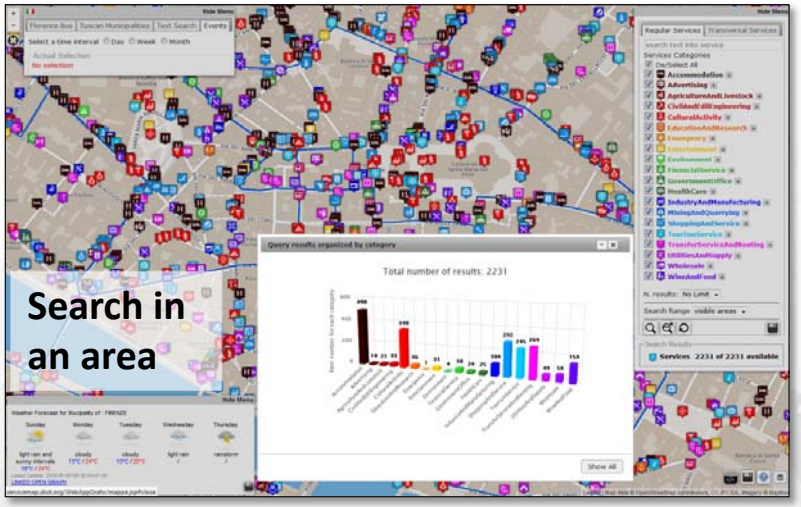


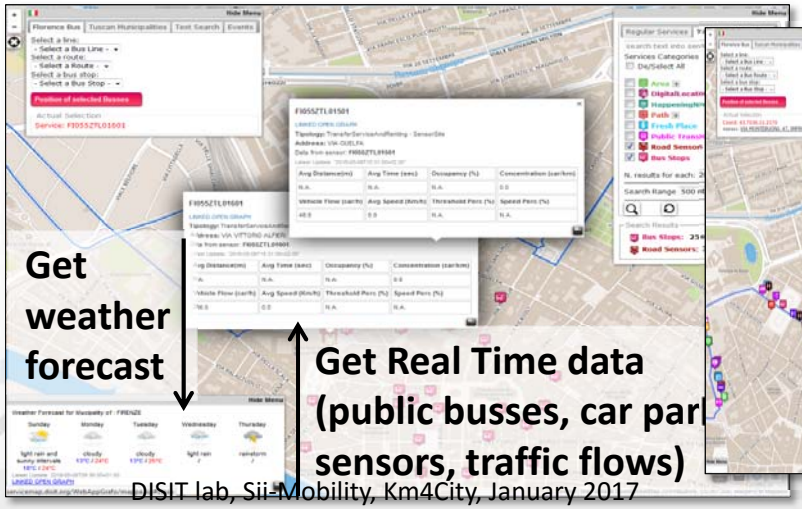
ServiceMap Development Tool

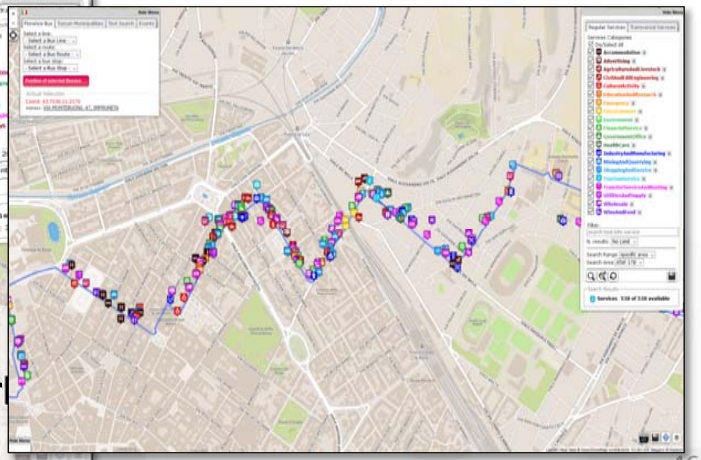








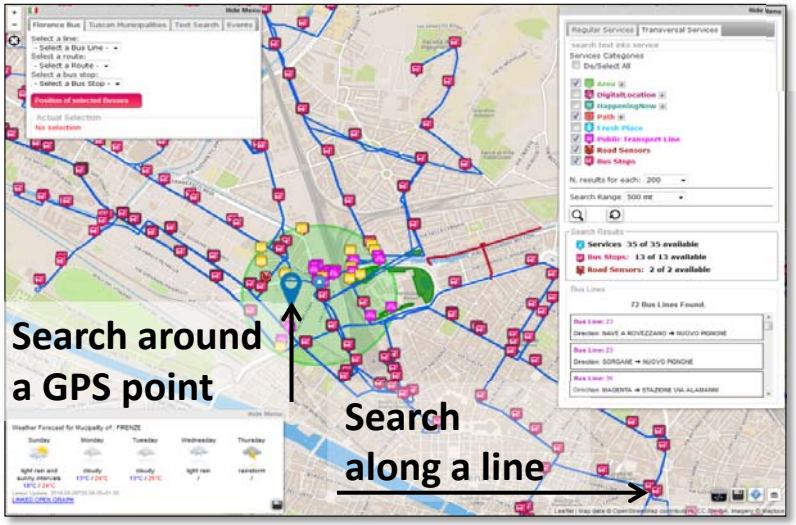


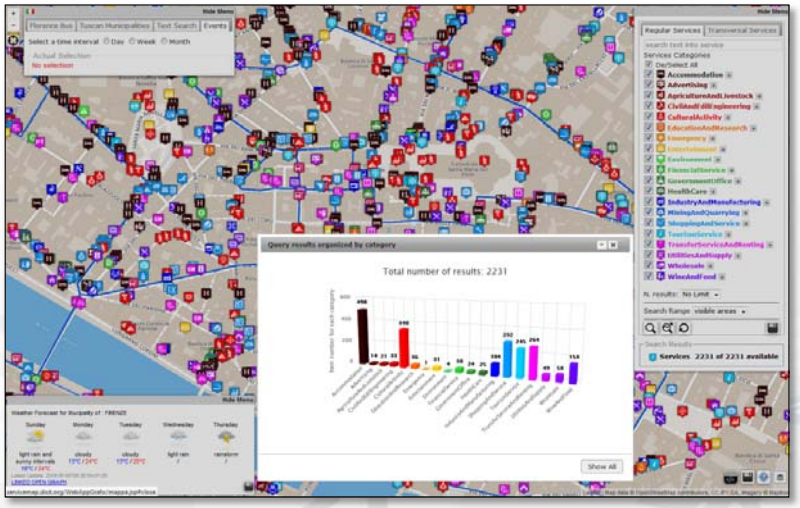


UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB http://www.disit.org

ServiceMap Dev Tool

Sii-Mobility



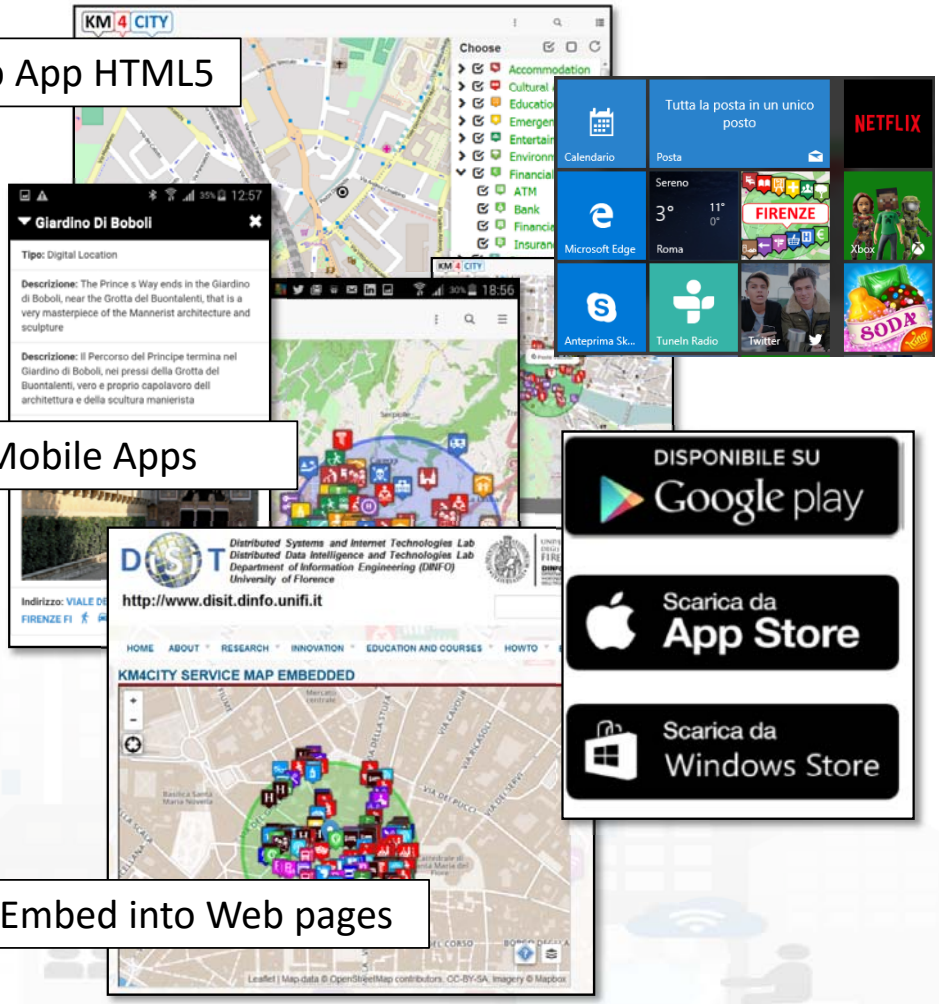


Smart City API call generation

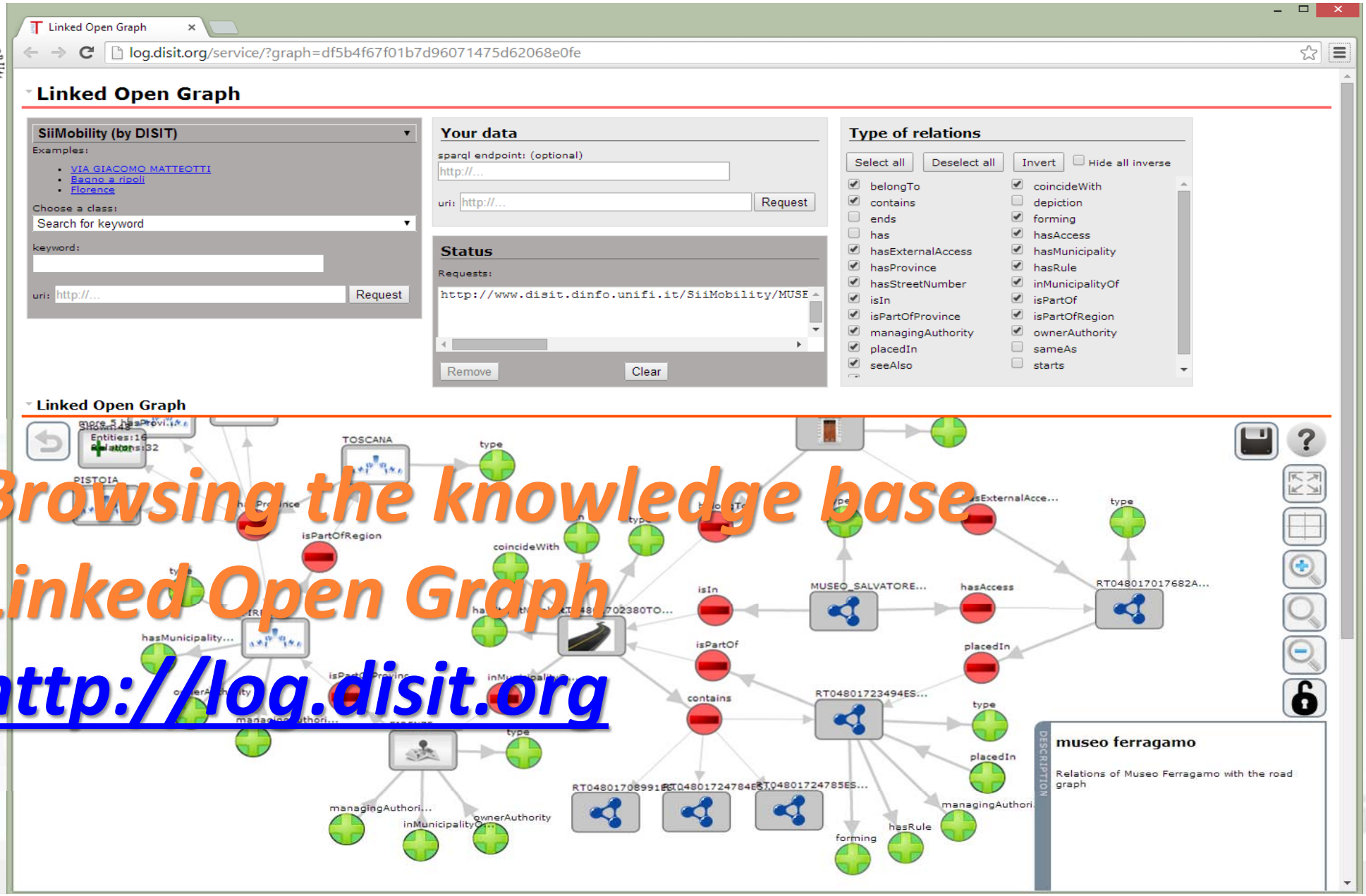
Web App HTML5

Mobile Apps

Embed into Web pages



http://www.disit.org/6873

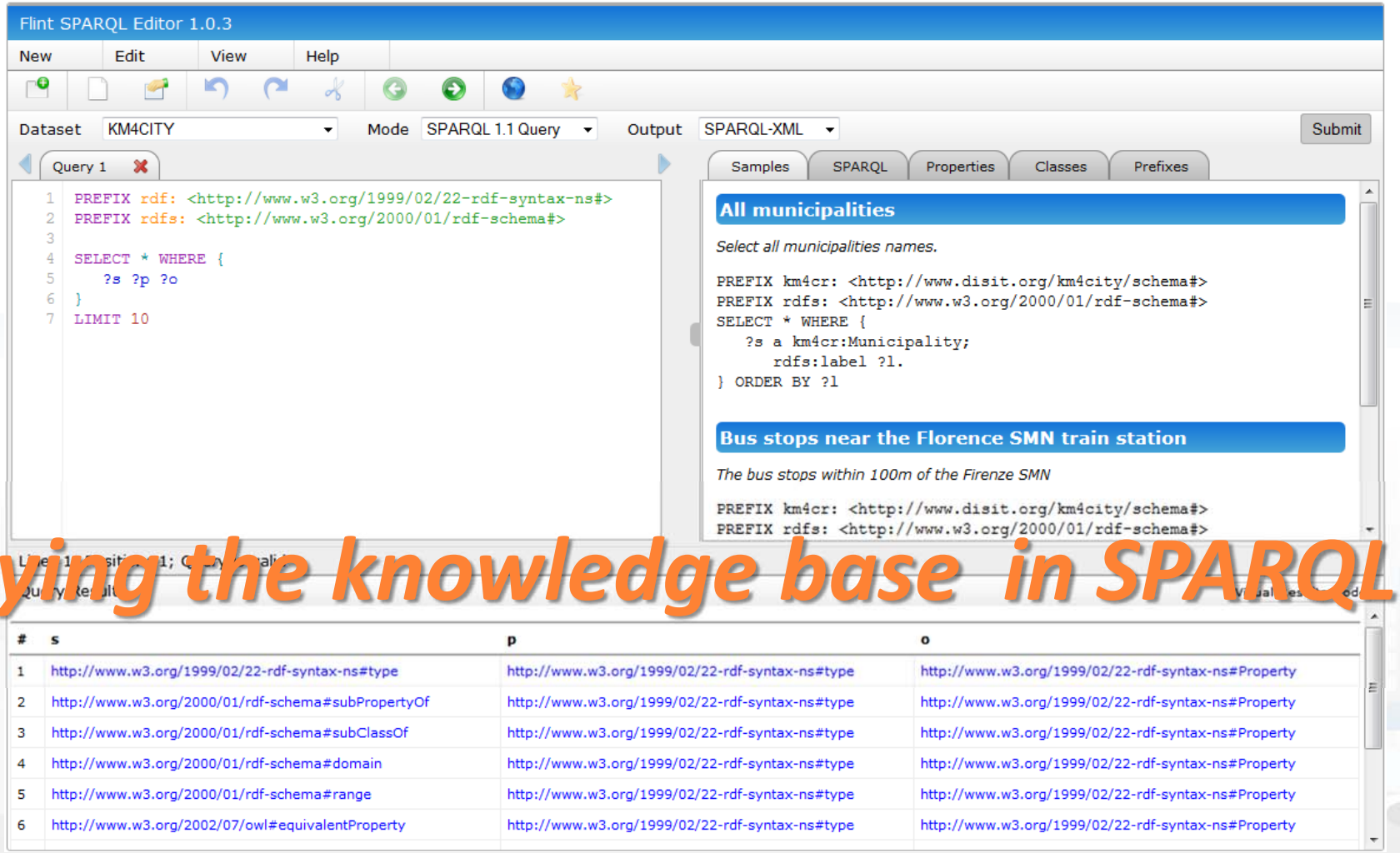


Browsing the knowledge base Linked Open Graph

http://log.disit.org

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB http://www.disit.org

http://log.disit.org/spqlquery/



Querying the knowledge base in SPARQL

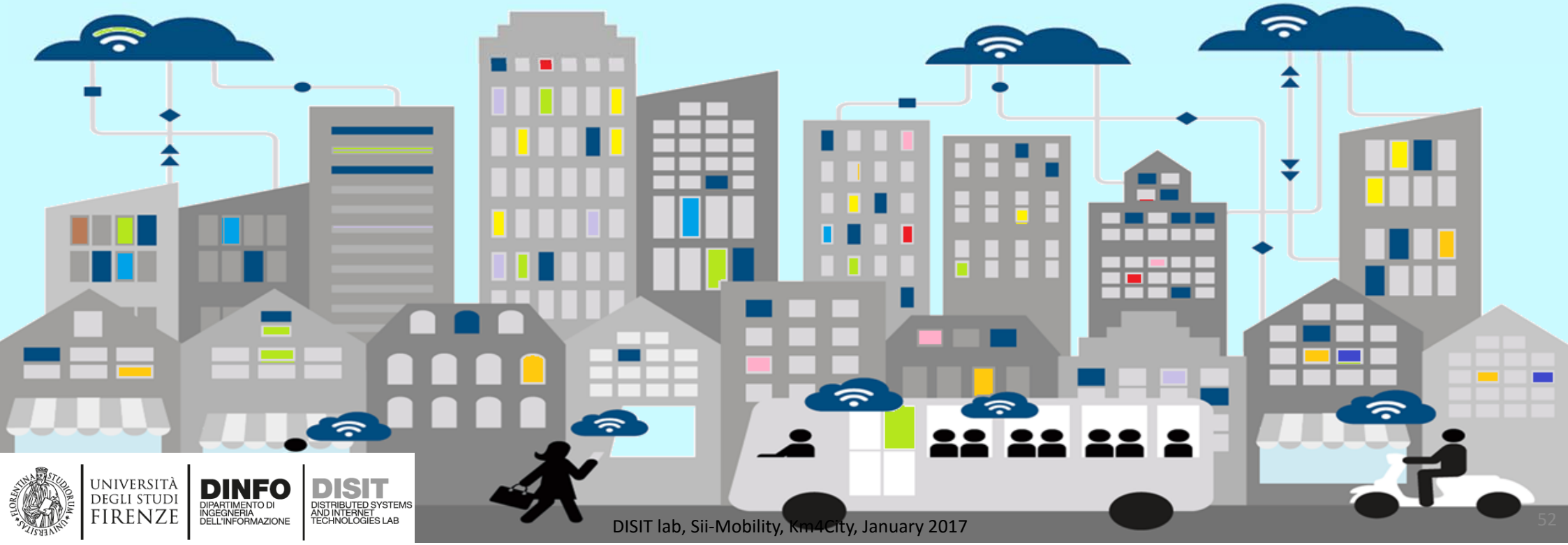
#	s	p	o
1	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
2	http://www.w3.org/2000/01/rdf-schema#subPropertyOf	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
3	http://www.w3.org/2000/01/rdf-schema#subClassOf	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
4	http://www.w3.org/2000/01/rdf-schema#domain	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
5	http://www.w3.org/2000/01/rdf-schema#range	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
6	http://www.w3.org/2002/07/owl#equivalentProperty	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property

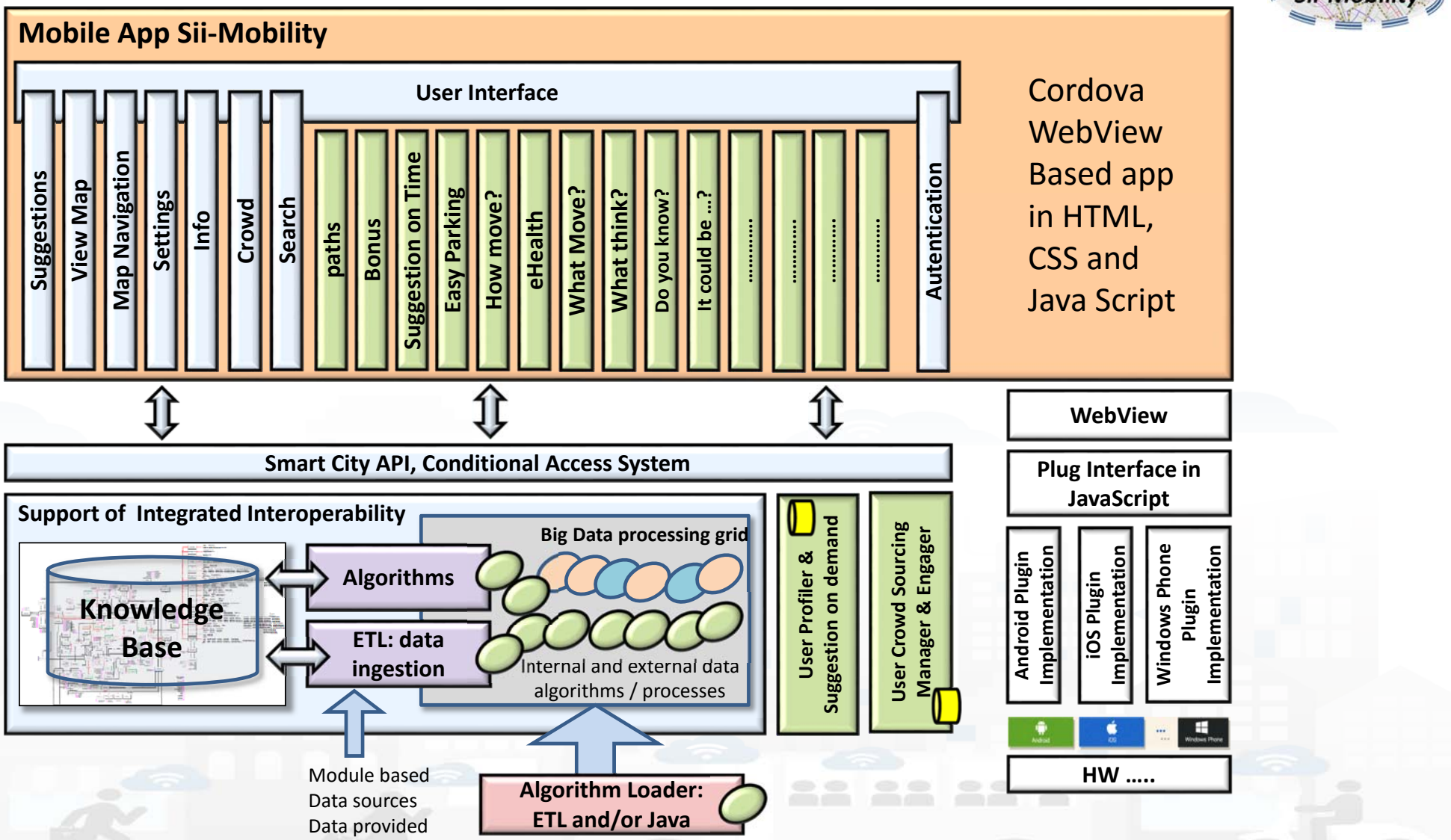
How to Legally work with App Kit

Licenze of App KIT

- **Sii-Mobility is Open Source GPL on GitHub as DISIT lab:**
  - https://github.com/disit
- **Sii-Mobility App Kit**
  - Affero Open Source GPL, ver.3.0
  - has a limited coverage of features with respect to the whole «Toscana dove cosa ..» …. Apps
  - can be only used to develop additional App Modules that CAN be integrated to the main «xxxxx dove cosa ..» Apps family by DISIT Lab
- **Mobile App «Toscana dove cosa ..»** is
  - available for cities that would like to develop their version of «xxxxx dove cosa» App Family, published by DISIT Lab
- Smart City API can be used for developing proprietary Apps

Planned Additional Modules for the Mobile App




Mobile App Sii-Mobility
User Interface
Suggestions
View Map
Map Navigation
Settings
Info
Crowd
Search
paths
Bonus
Suggestion on Time
Easy Parking
How move?
eHealth
What Move?
What think?
Do you know?
It could be ...?
.....
.....
.....
.....
Autentication
Cordova WebView Based app in HTML, CSS and Java Script
Smart City API, Conditional Access System
Support of Integrated Interoperability
Knowledge Base
Algorithms
ETL: data ingestion
Big Data processing grid
Internal and external data algorithms / processes
User Profiler & Suggestion on demand
User Crowd Sourcing Manager & Engager
Module based
Data sources
Data provided
Algorithm Loader: ETL and/or Java
WebView
Plug Interface in JavaScript
Android Plugin Implementation
iOS Plugin Implementation
Windows Phone Plugin Implementation
HW .....

modulo itinerario, percorso	(MAPP04)	Modulo per web app e mobile per la richiesta di informazioni riguardo alla pianificazione di un percorso che preveda eventuali tappe intermedie e la loro visualizzazione interattiva. Dovrà essere possibile imporre vincoli sui mezzi da utilizzare e su come indirizzare il calcolo (percorso più veloce più economico, più sostenibile), etc. si veda requisiti del pianificatore e delle API che permetteranno a questo modulo di funzionare.
modulo profiling, comportamento virtuoso	(MAPP05)	Modulo per web app e mobile per la richiesta di informazioni riguardo alle info personali e preferenze ed al suo comportamento passato (e.g., prevalenza bus, car, moto, bike, etc.). Suggerisce comportamenti virtuosi, come l'uso di mezzi a minor impatto ambientale, l'uso di scambiatori, anche arrivando ad offrire bonus se possibile, prendendoli da un carnet di Bonus della PA o delle TPL.
modulo suggestion del tempo e nello spazio	(MAPP06)	Modulo per web app e mobile che sfrutta gli algoritmi di pianificazione accessibili via API per fornire suggerimenti nel tempo e nello spazio. Per esempio: hai tempo passa da Mario, visto che sei qui visita XX, perché non parcheggi qui visto che hai ancora 20 minuti, oppure anche semplicemente dato un certo punto GPS impostando il tempo a disposizione, viene suggerito un percorso che suggerisce di visitare punti di interesse in base alle preferenze dell'utente.
modulo parcheggio easy	(MAPP07)	Modulo per web app e mobile che permette di monitorare lo stato dei parcheggi o di un parcheggio in particolare per evitare di arrivare al parcheggio senza sapere se vi sarà posto. Questo, avendo i dati, potrà essere usato in riferimento ai parcheggi coperti o lungo strada.
modulo ECOGUIDA	(MAPP08)	Modulo per web app e mobile che sfrutta gli algoritmi di profilazione e la valutazione del comportamento dell'utente per suggerire soluzioni di mobilità alternative. Utilizza le smart City API per accedere ai dati delle abitudini della persone, delle alternative, dei servizi presenti sul territorio, etc. ECOGUIDA
modulo tieniti in forma	(MAPP09)	Modulo per web app e mobile che sfrutta gli algoritmi di profilazione e la valutazione del comportamento dell'utente per suggerire soluzioni di mobilità che possono tenerlo in forma. Utilizza le smart City API per accedere ai dati delle abitudini della persone…….
modulo lascia un commento, "che ne pensi……"	(MAPP10)	Modulo per web app e mobile che sfrutta gli strumenti di geolocalizzazione dell'App per capire dove si trova l'utente e se è rimasto fermo per un certo periodo in qualche punto di interesse o che ci è stato, gli può chiedere conferma, ma anche richiedere un contributo: un commento, un score, una foto. Utilizza le smart City API per accedere ai dati delle abitudini della persone e capire i servizi geolocalizzati, etc.
modulo servizi commerciali, "ma lo sai che ?"	(MAPP11)	Modulo per web app e mobile che sfrutta gli strumenti di geolocalizzazione dell'App per capire dove si trova l'utente e se è rimasto o sta passando a piedi o in auto per un certo punto di interesse. Che magari gli può interessare sulla base del suo profilo. Il sistema gli invia una notifica in push (il telefono chiede ed il server invia) dove si informa che riguardo a quel punto si possono promuovere commercialmente cose interessanti.
modulo partecipativo, "sarebbe opportuno che …"	(MAPP12)	Se si trova in modalità navigazione la destinazione è nota e lo fa il navigatore. Ma se la sua destinazione non è nota si può dargli una mano con questo modulo. Modulo per web app e mobile che sfrutta gli strumenti di geolocalizzazione dell'App per capire dove si trova l'utente e fornirgli delle indicazioni sulle strade che potrebbe prendere per raggiungere le sue destinazioni abituali tenendo conto anche di eventuali incidenti e traffico, e per ridurre il carico su certe direttrici.
modulo "sapevi che nel…."	(MAPP13)	Modulo per web app e mobile che sfrutta gli strumenti di geolocalizzazione dell'App per capire dove si trova l'utente e se è rimasto o sta passando a piedi o in auto per un certo punto di interesse. Che magari gli può interessare sulla base del suo profilo. Il sistema gli invia una notifica in push (il telefono chiede ed il server invia) dove si informa che riguardo a quel punto si possono raccontare aspetti presi da WikiPedia o da altra sorgente. Possibile necessità di caricare un modulo computazionale aggiuntivo in piattaforma Sii-Mobility (per elaborare e fare cache delle info estratte da dbpedia o da altri) oppure una base di dati.
modulo merci logistica	(MAPP14)	Modulo per web app e mobile per la richiesta di informazioni riguardo alla pianificazione di un percorso di distribuzione merci che preveda eventuali tappe intermedie e la loro visualizzazione interattiva. Dovrà essere possibile imporre vincoli sui mezzi da utilizzare e su come indirizzare il calcolo (percorso più veloce più economico, più sostenibile), etc. si veda requisiti del pianificatore e delle API che permetteranno a questo modulo di funzionare.
altro	(MAPP15)	1) Soluzione per il tracking di flotte di veicoli di operatori ecologici e infomobilità al guidatore, basato su mobile app e applicazione web di backoffice interoperabile con la piattaforma Sii-Mobility. 2) ….

	ETL data o processo di analytic	DB storico	attivazione	View only	Immissione dati
modulo itinerario, percorso	Si per computo routing	Centrale, user profile, storico bonus e percorsi	Da-a, da-a–a-a, GPS	no	Si
modulo profiling, comportamento virtuoso	Si per computo bonus	Centrale, user profile, storico bonus	Stato del comportamento o posizione	no	Si
modulo suggestion del tempo e nello spazio	Si per calcolo suggerimenti	Centrale, user profile, storico bonus	Stato del comportamento o posizione	no	No
modulo parcheggio easy	Dati parcheggi RT	Centrale, user profile, storico bonus	Stato del comportamento o posizione	no	No
modulo ECOGUIDA	Si per computo comportamento e suggestion	Centrale, user profile, storico bonus	Stato del comportamento o posizione	Si	Si
modulo tieniti in forma	per computo comportamento e suggestion	Centrale, user profile, storico bonus	Stato del comportamento o posizione	Si	Si
modulo lascia un commento, "che ne pensi……"	per computo comportamento e suggestion	Centrale, user profile, storico bonus	Stato del comportamento o posizione	Si	Si
modulo servizi commerciali, "ma lo sai che ?"	per computo comportamento e suggestion	Centrale, user profile, storico bonus	Stato del comportamento o posizione	Si	Si
modulo partecipativo, "sarebbe opportuno che …"	per computo comportamento e suggestion	Centrale, user profile, storico bonus	Stato del comportamento o posizione	Si	Si
modulo "sapevi che nel…."	per computo comportamento e suggestion	Centrale, user profile, storico bonus	Stato del comportamento o posizione	Si	Si
modulo merci logistica	Si per computo routing	Centrale, user profile, storico bonus e percorsi	Da-a, da-a–a-a, GPS	Si	Si
Modulo guida connessa	Si per computo routing	Centrale, user profile, storico bonus	Stato del comportamento o posizione	Si	Si
Modulo per connessione con ZTL via WIFI	per computo comportamento e suggestion	Centrale, user profile, storico bonus	Stato del comportamento o posizione	Si	Si

Info and Documents

Documentation

- **Documentation Smart City API, version 1, January 2017**
  - http://www.disit.org/6991 (document from Sii-Mobility)
- **App Kit development page:**
  - http://www.disit.org/6977 (slides ready, and video to appear)
- **Ontology and Km4City Tools:**
  - Http://www.km4city.org
  - http://www.disit.org/6506 Ontology and documentation
- **Sii-Mobility is Open Source on GitHub as DISIT lab:**
  - https://github.com/disit
  - https://github.com/disit/siiMobilityAppKit (mobile App kit)
- **Data Ingestion processes and tools, tutorial:**
  - http://www.sii-mobility.org/index.php/documentazione/slide-e-altro
  - http://www.disit.org/6690
- **Deliverables of Sii-Mobility:**
  - http://www.sii-mobility.org/index.php/documentazione/deliverable
- **FAQ of Sii-Mobility:**
  - http://www.sii-mobility.org/index.php/il-progetto/faq
- **Promotional Kit for «Toscana dove cosa App»**
  - http://www.sii-mobility.org/index.php/documentazione/kit-promozionale-app-toscana

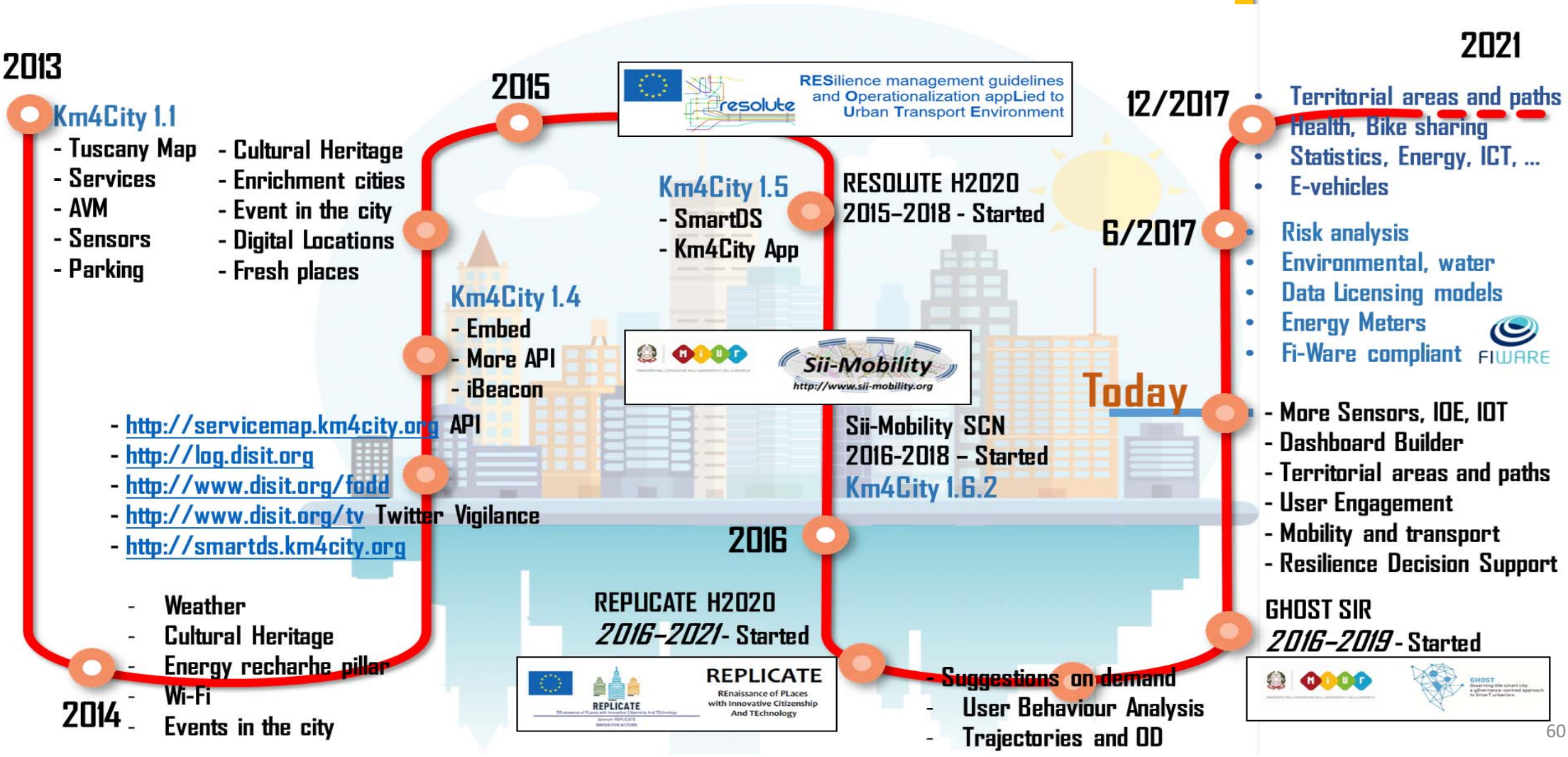
Open Source

Km4City, Sii-Mobility, RESOLUTE, REPLICATE: smart city big data open source tools. Km4City is a knowledge base and a research line of DISIT lab mainly developed before the start of Sii-Mobility, RESOLUTE, REPLICATE projects. While it has been mainly improved by them. Those projects are complementar each other and almost all of them use and contribute the Km4City research line.ServiceMap smart city knowledge base tool: smart city service tool (mainly developed for Sii-Mobility project) for accessing to km4city knowledge base, for service browsing and query, for **Smart City API** for mobile and for mobile development tool, http://www.disit.org/km4city

- **Km4City ontology model and files** are accessible from http://www.disit.org/km4city improved with the support of projects as Sii-mobility, REPLICATE and RESOLUTE
- **SCE, Smart City/Cloud Engine front end interface,** SCE is part of DISCES a Distributed SCE Scheduler Tools (SCE: Smart City/Cloud Engine), a DISIT tool for smart environments. It is currently in use in Km4City tools, and in ICARO Cloud project and service, see CLOUD page. Developed for ICARO, and then improved for Sii-Mobility, and used in many other projects
- **SCE, Smart City/Cloud Engine backend,** SCE is part of DISCES a Distributed SCE Scheduler Tools (SCE: Smart City/Cloud Engine), a DISIT tool for smart environments. It is currently in use in Km4City tools, and in ICARO Cloud project and service, see CLOUD page. Developed for ICARO, and then improved for Sii-Mobility, and used in many other projects
- **DIM-RIM**: Data Ingestion Manager and RDF Indexing Manager, WEB page on DISIT lab with user manuals, DIM and RIM area used in Km4City and tools, Sii-Mobility smart city national SCN project, RESOLUTE H2020
- **Dashboard Builder and executo**r: a tool for creating dashboard for smart city. See Km4City example of dashboard as reported in http://www.km4city.org/controlroomtools.html for the documentation see http://www.disit.org/6935 which is manual with examples regarding widgets. Developed for REPLICATE Project, and used in others as Sii-Mobility, RESOLUTE.
- **Sii-Mobility Dev Kit Mobile AppKm4city**: Open Source version of the Sii-Mobility mobile and web app, open modular (the full version is operative and accessible on all stores as "Firenze dove cosa", or " Toscana dove cosa", you can install from http://www.km4city.org/app). Developed for Sii-Mobility, adopted for the training and development meeting of the 24 January 2017, and as a basis for the Hackathon of 7-8 April 2017 in Florence.

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB http://www.disit.org

Roadmap



Acknowledgement

- Thanks to the European Commission for founding. All slides reporting logo of **RESOLUTE H2020** are representing tools and research founded by European Commission for the RESOLUTE project. **RESOLUTE** has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement n° 653460).
- Thanks to the European Commission for founding. All slides reporting logo of **REPLICATE H2020** are representing tools and research founded by European Commission for the REPLICATE project. **REPLICATE** has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement n° 691735).
- Thanks to the MIUR for co-founding and to the University of Florence and companies involved. All slides reporting logo of **Sii-Mobility** are representing tools and research founded by MIUR for the Sii-Mobility SCN MIUR project.
- **Km4City** is an open technology exploited by those projects and line of research of DISIT Lab. Some of the innovative solutions and research issues developed into the above mentioned projects are also compliant and contributing to the Km4City approach and thus are contributing to the open Km4City model of DISIT lab.

For the next parts

- **10:30-11:30**
  - **ServiceMap usage**
    - http://www.disit.org/6994
  - **Smart City API**
    - http://www.disit.org/6995
- **11:00-12:30** http://www.disit.org/6992
  - **Sii-Mobility Mobile App Kit on GitHub**
  - **How to develop new module**
- **For the whole App Kit development consult page with slide and video:**
  - http://www.disit.org/6977 (slide ready, and video to appear)