



COMPANY PRESENTATION



ISO 9001
BUREAU VERITAS
Certification



SA 8000
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HISTORY

Tages is a cooperative that works in the field of mobility and transport systems planning and project (both passengers and goods).

Founded in 1983 as a "studio associato" by a group of graduates in Transportation Engineering at the University of Pisa, Tages rapidly turned into the current cooperative organisation (1985) which was best suited to include and integrate the skilled professionals who were gradually involved in the many activities of study and research performed in the field of mobility systems, with a special focus on technical and economic issues about correlations between mobility, transport and land use.

OUR ORGANIZATION

Tages' staff is mainly made of engineers with a specialization in transport planning. Some of them are also committed in collaboration and research with the Faculty of Engineering of the University of Pisa. The staff is completed by other professionals who are experienced in technical and economic issues and in computer science. Within the company, the skills are organized by topic area for the different activity sectors:

- Planning
- Urban Mobility
- Public transport
- Freight transport and logistics
- Mobility Infrastructures
- Mobility Observatories
- Questionnaires and surveys
- Global service
- Research.

OUR CLIENTS

Our main clients are Local Authorities (such as Regions, Provinces, Municipalities) and Transport Companies and others that are in charge of planning or design and management of mobility systems. Other important clients are Private Companies (like Prada, UniCoop, and others) involved in the creation of demand attractors / generators and in the evaluation of their effects on the mobility networks.

OUR ACTIVITY SECTORS¹

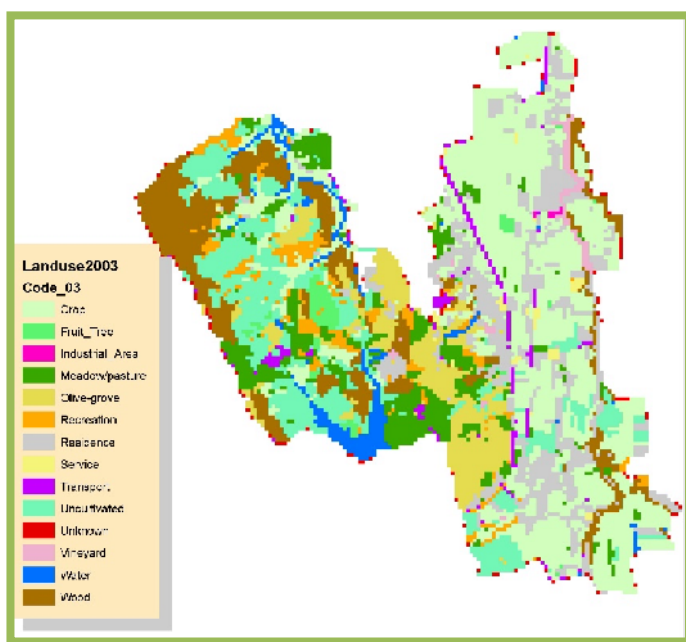
TERRITORIAL PLANNING

In this field we mainly address network infrastructures and mobility supporting urban and country planning. More specifically, we relate to the different levels of the Local Authorities (Regions, Provinces, Municipalities) to perform the design activities provided for in the urban development plans. We also perform the assessment of effects and impacts that the intended land use can lead to in the functional structure of urban systems and open territory.

Activity list

- Territorial analysis through geocomputation or geomarketing-based methods.
- Creation of Decision Support Systems (DSS) based on spatial Multi-Criteria Analysis (Hierarchy Process or various versions of the ELECTRE method) integrated into Geographical Information Systems (GIS).
- Modeling for classification and forecast of complex territorial phenomena (modal choice processes, spatial interaction models, evaluation of land sensitivity to the construction of new dumps or landfills, roads or railroads, etc.).
- Analysis of the interaction between mobility (flows, parking, use of public transport etc.) and territory (accessibility, population density, density of activities, etc.) through classic statistical techniques or Machine Learning - based techniques such as Datamining and Bayesian Networks.

In the figure it is represented the model of land use change elaborated for the Preza territory (Albania) (with the land use classification) while in the table the extracted prediction rules using the Decision Tree Inductions tools and used to forecast land use dynamic.



¹ For more details, please see our website www.tages.it

EX. Classification rules

(LU_{before} not equal to LU_{after})

Table 2-4. Transformation rules for land-use groups in 1996-2003

1996	Principal conditions	Secondary conditions, if applicable	2003
Permanent cropping	Medium-to-high level of fruit trees in vicinity	AND Original parcel medium in size AND No additional condition	Uncultivated
Temporary cropping	100%>slope>75% AND No pastures/meadows in vicinity	Near to urban main road AND	Permanent cropping
	100%>slope>75% AND Low number of buildings in 500m AND No transport in vicinity AND Medium-to-low erosion risk	AND Original parcel low in size AND Small distance to nearest road AND Original parcel high in size AND No pastures/meadows in vicinity	Uncultivated

IF

THE

INTERNATIONAL, NATIONAL AND REGIONAL PROJECTS

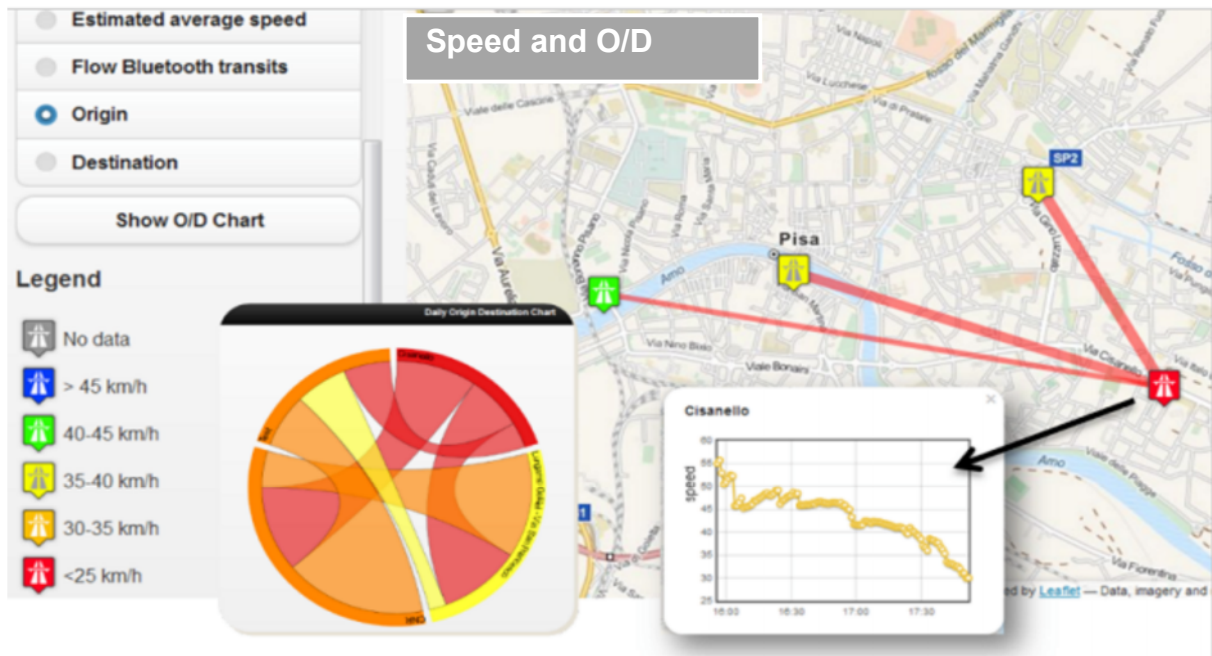
Tages has worked in European and ExtraEuropean Projects about mobility both for passenger than freight transport side. For example, Tages worked in the Ital-Med Project about freight traffic between Italy and the North Africa, in the Project POSSE - Promoting Open Standards and Specifications in Europe with important Administrations like the cities of Burgos (ES), Reading (UK), Brno (CK) and others. In this project Tages developed the first Italian ITS Implementation Plan for Pisa Municipality. In the next figure the ITS matrix introduced from Tages in this Plan.

		1	2	3	4	5	6	7	8	9	10	11
		Environmental impact mont./control	Social life	Congestion and speed monitoring	Road safety	Public Safety (Civil Protection)	Public participation	Transport Planning on longterm	Revenue analysis	Info-mobility	Parking management and use	Transport management and scenario
ITS	Criteria											
	A Road gates on street											
	B Road gates on Controlled Traffic Zone											
	C VMS											
	D Traffic light control system											
	E Traffic counters											
	F Freight permits and access											
	G Auxiliary Rfid parking readers											
	H Parking meters data											
	I APP for Parking payment											
	L Bike-sharing users data											
	M Flooding sensors on underpasses											
	N Bluetooth sensors											
	O Works on street											
	P AVM on bus											
	Q Passenger counting - O/D											
	R Private bike monitoring											
	S Data Rfid parking on street											
	T Data from OBU on tourist busses											
	U APP for activities monitoring											

Tages worked in the project MEROPE (INTERREG IIB) about freight transport demand, PIMEX and SIC (P.O.Italy-France Maritime 2007-2013) regarding passengers and freight safety and intermodality, in the project INFOLIV of the Province of Leghorn and in the project IMP-I-mobility in Pisa for the Municipality of Pisa (Info-mobility and ITS plan). In the following figure we represent a SIC project result with the Corsica main places connected with intermodal transport modes (bus+ship), with a clear weakness of actual transport system.

Locality	N° autobus trips starting for Bastia	N° autobus trips arriving from Bastia
Ajaccio	0	0
Aleria	2	1
Calvi	1	0
Casamozza	3	1
Corte	0	0
Ghisonaccia	2	1
Ile Rousse	1	0
Macinaggio	2	1
Ponte Leccia	1	0
Porto Vecchio	0	1
Saint Florent	2	0
Solenzara	2	1

Tages s.c. is partner of the project Smart City Enabler (to be presented in the next 2015 Polis Meeting in Bruxelles) where it collaborate with many European partners to develop a simplified and innovative cloud platform integrating ITS data to manage urban mobility. In the next figure, you can see the system to monitor Origin/Destination matrix and real time mean speed in each street by means of Bluetooth sensors.



At the moment TAGES is coordinating the EasyConnecting Project for Abruzzo Region (logistic and optimization of freight traffic in the Adriatic area) and it is collaborating with other partners in the European Project LOSE-logistic and security in the freight transport.

URBAN MOBILITY

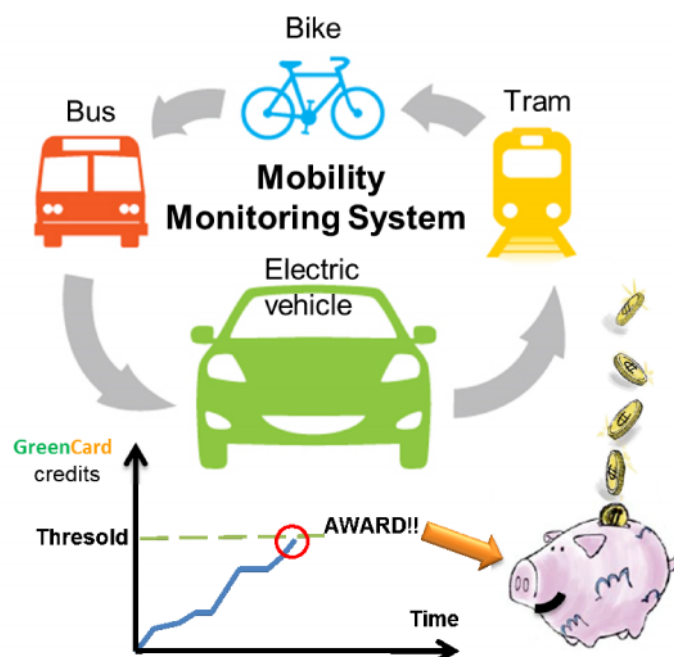
Urban mobility planning in Italy is carried out mainly by designing local transport plans (whose acronyms are P.U.M., P.G.T.U. etc.) aimed at making urban mobility compatible and sustainable in respect of life quality. Over the years, Tages has developed a specific research area dealing with this strategic component of urban planning, with the aim of assessing the relations between town design and accessibility regulations. Moreover Tages is actually involved in two different SUMPs-Sustainable Urban Mobility Plans (Cities of Siena and Piombino) where it is following the recently developed European Guidelines for SUMP.

Activity list

- Integrated planning for the increase of transportation sustainability:
 - Design and review of city centre accessibility;
 - Design and update of parking plans (i.e. *park and ride* systems);
 - Design and update of the public transport network;
 - Analysis of eco-friendly mobility systems;
 - Design of bike lanes networks and bike sharing facilities to integrate diffuseness, safety and accessibility;
 - Design and update of pricing policies;

- Design of systems for the management of transport demand (info-mobility, traffic calming, car sharing, Demand Responsive Transit Services etc.).
- Analysis of mobility through the assessment of interactions between the components of transport network (private and public vehicle flows, bike and pedestrian flows, freight flows etc.) and economy (new malls or industrial districts, new residential districts).
- Large-scale (four-steps models) or medium-scale modeling of the transportation network for the assessment of the impact of road network changes or settlement of new activities.
- Forecasting of transport demand through Stated or Revealed Preference surveys; creation of Discrete Choice Models, either classic (Multinomial Logit, Nested Logit) or advanced (Crossed Nested, Mixed Logit), for the estimate of transport demand for new urban transport systems such as BRT, People Mover, Tramways, Metro/SubWay, etc. or to assess modal split.
- Dynamic micro-simulations for the assessment of the network's Level of Service and gas emissions.
- Analysis of parking system and parking fares.
- 3D modeling of new town districts, renovated neighborhoods, new infrastructures.

In the figure it is represented the Rewarding System introduced in the Pisa Mobility Plan.



SUSTAINABLE MOBILITY

• *PUBLIC TRANSPORT*

Tages has designed a lot of important projects of transportation networks (trains, buses, tramways, school buses) both in urban and rural areas, also assessing the costs and benefits of the projects in terms of effectiveness and efficiency in comparison with the current situation.

The problem of sustainability of a public transport network challenges the designers to take into account a number of variables, among which operating costs, a very relevant budget item for a network that is being designed, also with regard to the expected benefits.

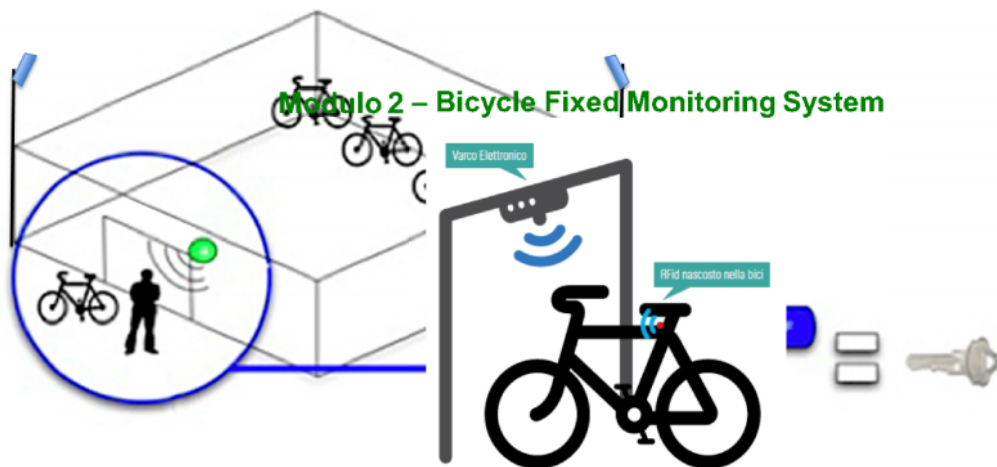
Activity list

- Accessibility analysis.
- Construction of indexes to evaluate the performance of Public Transport networks.
- Planning and design of Public Transport networks and both classic and innovative Public Transport systems such as Bus Rapid Transit, People Mover, Tramways, Metro/SubWay, etc..
- Large-scale or medium-scale modeling of multimodal transport for the simulation of complex networks and of re-organization of Public Transport lines.
- Design of Demand Responsive Transit and study of technical and economic feasibility.

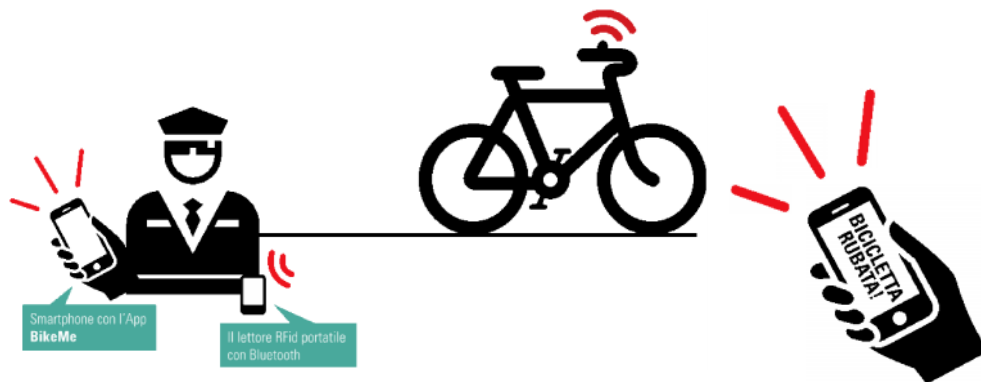
• *BICYCLE PROJECTS*

In the last few years, Tages has worked both from the planning than from the project side, in many bicycle networks (for example in the network of Pisa, Empoli, Cascina, Orbetello and others). Moreover Tages researchers developed the new bicycle anti-theft system called SaveMyBike, introduced recently by Tuscany Region in its priority projects. In the following figure you can see the three modules integrated inside the SaveMyBike project.

Modulo 1 - Urban Bicycle Secure Area



Modulo 3 – Theft bicycle recovery



FREIGHT TRANSPORT AND LOGISTICS

This field mainly deals with the reduction of freight transportation and distribution costs, that affect the price of goods and their competitiveness in the market.

Another issue is urban distribution logistics and reduction of its impacts on mobility, also with reference to access restriction in areas with a high environmental value or a high demand attraction.

Activity list

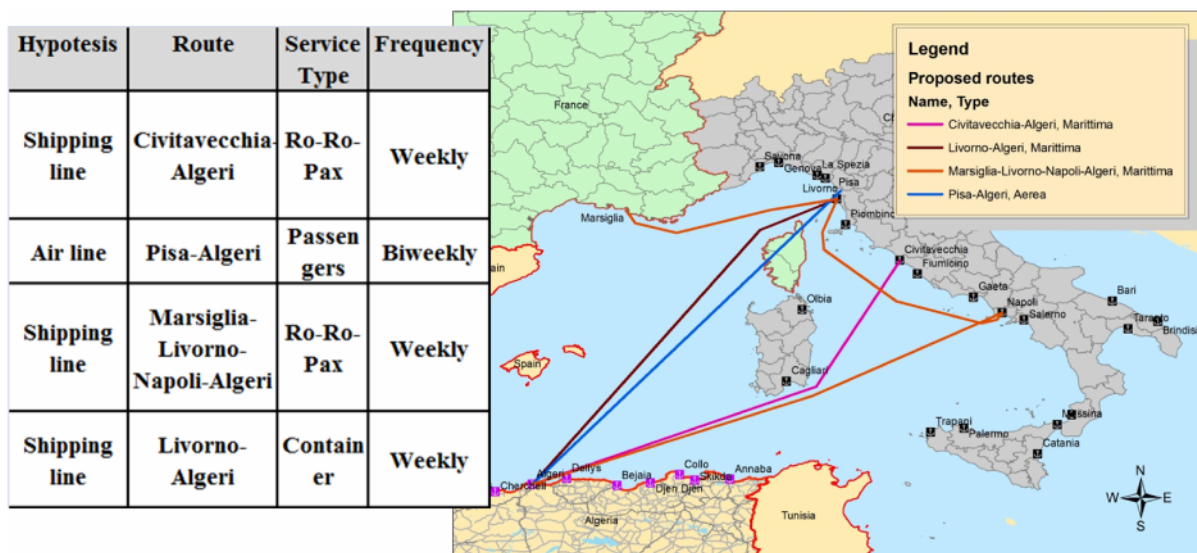
- Planning and simulation of urban freight transport (City-Logistic). In the next figure, it is shown the simulation of Vehicle Routing Solution for the evaluation of a



City-Logistic Platform in the city of Leghorn (for a cost-benefit analysis).

- Vehicle routing problem solving (uni-depot or multi-depots) even with constraints concerning availability of parking space for loading and unloading, duration of delivery in case of perishable goods, lapse of time allowed for delivery and pick up, capacity of vehicles etc.
- Analysis of logistic systems on a large scale (i.e. logistic optimization of a supply chain).
- Feasibility studies for new logistic platforms;
- Modeling for freight transport simulation for:
 - Analysis of gravitational influence of ports, intermodal terminals and other nodal infrastructures for logistics;
 - Design and feasibility studies of new maritime trips, new transport systems, new logistic structures or infrastructures.

In the next figure it is represented a results of the Ital-Med project with the proposed maritime routes between Italy and Algeria.



MOBILITY INFRASTRUCTURES

The urban and country planning performed at different levels by Local Authorities provides for structural projects intervention to plan and support mobility systems.

In this respect, Tages has gained experience through the design of "piani attuativi" (local detailed plans), also carrying out the executive design of infrastructures for mobility and public transport.

MOBILITY OBSERVATORY

The complexity of mobility systems and their variability in time led Tages to develop mobility monitoring systems aimed at detecting and registering the variation of transport demand and vehicle flows on the road network. The goal is to build a consistent knowledge of how urban systems work, in order to support Local Authorities in making decisions and monitoring the effects of actions taken.

The Observatory keeps and elaborates the mentioned data on behalf of Local Authorities. It can provide real time information to working info-mobility networks.

SURVEYS

Studies and projects related to mobility systems require the acquisition of accurate data to describe the components of mobility and transport demand. From experience in this field, Tages has developed its own methods to perform surveys and analysis, pursuing an optimized sizing of data gathering in respect to the size and complexity of the system to be surveyed.

A further field of Tages' interest is the carrying out of questionnaires related to customer satisfaction surveys and potential transport demand.

Activity list

- Gathering of data on vehicle flows: acquisition through special devices or video footage (i.e. turns at an intersection).
- Private transport Origin - Destination (OD) surveys: manual acquisition (higher detail) or automatic acquisition through Bluetooth devices; analysis of data gathered.
- Users Passengers surveys or OD surveys in the field of Public Transport; analysis of data gathered.
- Stated Preferences surveys for the study of potential transport demand and Customer Satisfaction questionnaires in the field of Public Transport.
- Design of Geographical Information Systems aimed at performing the mentioned surveys in the field of mobility (i.e. management and safety of stops).
- On-line publication of data on Web-GIS platforms through open-source softwares.
- Design and construction of customized GIS for data exploration, editing and updating, with assisted creation of charts and reports.

GLOBAL SERVICE

Tages wanted to broaden its range of activities, so it carried out a lot of cooperations with Local Authorities and other Public Bodies. Tages provided for the supply of services to departments such as Transport and Mobility Bureau or Local Police etc.

The contracts awarded to Tages for this kind of service require to provide the departments or bureau with real time on-line services. This includes the management of green numbers or call centers dedicated to users, so that they can ask for information or complain about service quality, or even make reservations for a Demand Responsive Transit Service.

RESEARCH

Tages is interested in advanced modeling of transport demand, with reference to the implementation of Activity-Based methods for the simulation of the choice process (route assignment, trip distribution etc.). These methods are currently unavailable in four-steps models, that do not take into account a variety of phenomena (i.e. trip chaining, occasional mobility, consequences of change of opening and closing hours on vehicle flows etc.).

Tages is also active in a large scale territorial research field dealing with the evolution of land use in time. More specifically, research is concerned with urban sprawl, which is leading to land consumption and impermeabilization.

Another research branch concerned the implementation of integrated landuse-transport models by means of Cellular Automata and landuse multi-temporal analysis.

On the side of urban planning, Tages is involved in research on analysis of:

- urban systems,
- urban functional systems,
- urban centrality and marginality (for which a specific method has been designed, inspired by Configurational Analysis and Space Syntax),
- multivariate correlation between location of activities and social phenomena such as crime, urban blight, neighborhood security, residential clustering etc. (use of Weighted Geographic Regression, Principal Components Analysis and other geostatistical techniques).

About urban transport and mobility we are researching about:

- ITS to change urban mobility behaviors (Project GreenHaviour),
- Rewarding and mobility credit market to incentive,
- Anti-theft system to monitoring private bicycle use in urban areas (project SaveMyBike),

- Low cost Bluetooth sensors to monitor urban vehicle speed and Origin-Destination of journeys (Project BLUTA-BLUetooth Traffic Analyzer)
- Intelligent city-logistic distribution (further development of Furbot project)
- Intelligent participative population survey system to monitor modal split dynamics and mobility actions impacts on urban population

Recent scientific papers

Tages members have always carried out research and innovation activities in the field of mobility with several papers submitted and presented both in national than in international contexts.

*Studies and projects carried out on mobility systems integrated
in the urban planning process and synthesis of the main works
carried out in the period 2009-2016*

A NOTE ON METHODOLOGY

Starting from the reconstruction of the actual transport knowledge framework both at the supply and demand level, Tages integrates the planned urban activities/actions in the urban functional system, evaluating the impact of the trips generated and/or attracted on the global and local mobility level.

In practice, we assess the critical issues that can arise from the interaction between land use and mobility and propose solutions regarding mobility system in its different components (stop, regulation accessibility as 30 persons or persons pedestrian calming measures traffic, public transport network to the integration of solutions using ITS systems).

For example Tages evaluated the generation/attraction of trips due to new planned activities in the Municipality Urban Development Plan Variant of Cascina (Pisa), Empoli (Firenze), Campiglia, Suvereto and Piombino (Livorno).

Moreover Tages worked in many Urban Development Plan integrating our expertise with the other technician or expert coming from other fields, like in San Vincenzo (Livorno), Chiusi, Pienza, Chianciano Terme (Siena), Pisa e San Giuliani Terme (Pisa), Lastra a Signa, Pontassieve e Calenzano (Firenze). Finally Tages worked with Tuscany Region in the regional Integrated Territorial Plan.

In the next figures we represent some elaborates coming from above works.

In the aboard table it is shown the resulting two flows scenarios coming from new planned activities in Cascina Municipality Urban Development Plan Variant (the two scenario change flows for the different type of activities introduced). It is clear the different impact of the two solutions on the mobility system, with a more than doubling of the generated flows. So our analysis can be also a support system to change activity destination of use).

In the next figure it is represented the survey of parking spaces with the representation of each parking areas and an analysis of its capacity and

UTOE	DESCRIZIONE	FLUSSI SC. 1	FLUSSI SC. 2
2	Laiaro	106	250
4	Comp.4	354	857
9	Comp.4	801	2.003
13	Comp.1	1.253	4.717
16	Comp.4	589	824
17	Comp.1b	371	488
13	Comp.1	310	310
4	Ex Mostra del Mobilio	1.111	1.111
28	Parco Sportivo	675	675
5	Latignano	359	854
16	Comp.1a	722	2.243
16	Comp.1b	675	1.831
16	Comp.2	616	1.438
4	Arraccio	623	942
20	Pettori	1.154	2.486
18	Titignano	269	560
4	IR r2/r3/r4	390	390
4	IR g1	514	1.019
4	IR g2	60	60
4	IR g3	282	328
4	IR g4	450	450
4	IR g5	340	488
4	IR g6	722	1.374
4	IR g7	263	475
4	IR r6	596	1.374
4	IR r7	451	815
39	Area Produttiva	5.290	13.970
38	Comp.2	4.184	11.173
38	Comp.3	382	1.354
41	Corfire Pisa	6.144	15.223
46		2.365	2.365
47	Centrale biomasse	30	30
TOTALE		32.450	72.476

occupation level both general than detailed for a single parking area (in violet the parking spaces occupied from the night, probably residents, while in green color the new arrived cars; the red line is the park capacity).

