



SIDT2012

XIX Convegno Annuale e Seminario Scientifico della
Società Italiana Docenti di Trasporti

“La riduzione delle risorse nel settore del trasporto collettivo:
effetti economici, sociali, ambientali e possibili soluzioni”

Padova 18, 19 Ottobre 2012



con il patrocinio di



DICEA
Dipartimento di Ingegneria
Civile, Edile e Ambientale



e con il supporto della



18 October 2012 – Auditorium Centro Culturale “Altinate San Gaetano”

Registration (8:00 – 9:30)

Opening (9:30 – 10:00) SIDT President

Session 1 (10:00 – 11:00) Transportation Planning

Traffic basins of Calabria region: methodology and application

PAVONE G., Chilà G., Filella A., Meduri G., Trecozzi M.R.

LUTI and DEA for simulation and evaluation in urban transport planning

Musolino G., RINDONE C.

Strategies to implement a transportation-efficient regional development

Cappelli A., Libardo A., NOCERA S.

Public engagement for planning and design transportation systems: tools and experiences

Cascetta E., PAGLIARA F.

Towards lean transportation infrastructures: defining value and identifying MUDA

Cascetta E., DA GIAU A., Furlan A., Macchion L., Vinelli A., ZANOTTO M., Binotto F., Fioratti M.

Session 2 (11:00 – 12:00) Public Transport

Key factors affecting rail service quality. A decision tree approach

DE OÑA R., Eboli L., Mazzulla G.

The local public transport in Italy: state, prospects and international comparisons

Cascetta E., PAPOLA A.

Application aspects of the tram-train system. The case of Brescia

Maternini G., RICCARDI S., Cadei M.

Classification of urban settlements and public transport improvement

Carrese S., SALES A.

Change to survive: public transport and new technologies for Europe global competition

CAPPELLI A., Libardo A., Nocera S.

Session 3 (12:00 – 12:50) Travel Behaviour

On the attributes and influencing factors of end-users quality perceptions in urban transport: an exploratory analysis

BARABINO B., Corona G., Deiana E.

User empowerment and advanced public transport solutions

FILIPPI F.

An experimental analysis of the propensity for voluntary travel behavior changes

Meloni I., SANJUST B., Sottile E.

The value of aesthetics in railway stations: a quantitative analysis of perceived quality for travellers

Cascetta E., CARTENÌ A.

Buffet (12:50 – 13:45)

Session 4 (13:45 – 14:35) Network Design

Models and algorithms for solving the combined assignment-control problem

GALLO M., D’Acerno L.

Stability of traffic lights as dynamic switching systems and sensitivity of the performances

Di Febbraro A., SACCO N.

Experimental analysis of the performance of an urban road system: an innovative approach using data envelopment analysis

FANCELLO G., Uccheddu B., Fadda P.

Stochastic equilibrium assignment with variable demand: two variables solution algorithm performance and effects of choice models

CANTARELLA G.E., de Luca S., Di Gangi M., Di Pace R.

Session 5 (14:35 – 15:35) Sustainable Mobility

A dynamic simulation based model for optimal fleet repositioning in bike-sharing systems

CAGGIANI L., Ottomanelli M., Sassanelli D.

"ELEbici@Roma3": an innovative project for sustainable mobility

Carrese S., CIAFFI F.

Strategies to achieve an "ecological airport urbanism": the Venice airport case

CIPRIANI L.

An innovative car-sharing system for sustainable mobility in urban area

Gattuso D., Pietrafesa M., Pudano A., RESTUCCIA A.

Driving behaviour, slope and vehicle load factor impacts on bus fuel consumption: real case application in the city of Rome

Carrese S., LA SPADA S.

Coffee break (15:45 – 16:00)

Session 6 (15:50 – 16:50) Logistics I

City logistics planning and urban freight transport modelling: recent trends

NUZZOLO A., Comi A.

ITS technologies for logistics. A state of the art

Gattuso D., PELLICANÒ D.S.

Trip chain behaviour of commercial vehicles in urban areas: the Parma case study

TOZZI M., Corazza M.V., Musso A.

Statistics for simulation of logistic platform

Gattuso D., CASSONE G.C.

A DSS for the assessment of city logistics measures

Nuzzolo A., Crisalli U., COMI A., Rosati L.

Session 7 (16:50 – 17:25) Logistics II

A model for reserved lanes design for freight vehicles

Polimeni A., VITETTA A.

Mode choice models for the assessment of italian freight transport policies

Nuzzolo A., CRISALLI U., Comi A., Rosati L., Panico F.

Indicators for city logistics

Musolino G., OTTOMANELLI M.

Session 8 (17:25 – 18:00) Travel Demand I

Evaluation of travel demand impacts in the case of rail system failures

D'ACIerno L., Gallo M., Montella B., Placido A.

Road transport elasticity: how fuel price changes can affect individual traffic demand

Musso A., PICCIONI C., Tozzi M., Godard G., Lapeyre A., Papandreou K.

An analysis of a suburban rail demand in the city of Naples

Biggiero L., CORAPI G.

19 October 2012 – Aula Magna “Galileo Galilei”, Palazzo del Bo’

Session 9 (14:15 – 15:15) Accessibility

Bus rapid transit vs regular bus system: comparing the impact on urban accessibility by public transport

Capri S., Ignaccolo M., INTURRI G., Rubulotta E.

A tool for an evaluation of reachability of an airport area

CONCA A., Papa F., Rubino S., Vignolo M.G.

Activity location and mobility costs

Nuzzolo A., Coppola P., PAPA E.

New measures of accessibility based on perceived opportunities

Cascetta E., Carteni A., MONTANINO M.

Assessing a general method to enhance airport passenger accessibility and resources optimization

Gualandi N., MANTECCHINI L., Paganelli F., Tagliazucchi C.

Session 10 (15.15 – 15.50) System Vulnerability

Ranking links in a road transport network: an application of Spearman’s correlation coefficient

ANGELINI S., Danesi A., Rossi G., RUPI F.

Travel time forecasting for vehicle routing: the case of urban evacuation

MUSOLINO G., Polimeni A., Vitetta A.

Demand simulation and planning for evacuation conditions

RUSSO F., Rindone C., Chilà G.

Coffee break (15:50 – 16:05)

Session 11 (16.05 – 16:30) System Efficiency

Energy efficient speed profiles for suburban train operation: a simulation model

DE MARTINIS V., Gallo M.

Effects of full automation on technical-economic efficiency in metro systems

ANTOGNOLI M., Ricci S.

A model for transit design with choice of vehicle type and energy charging system

FUSCO G., Alessandrini A., Cipriani E., Colombaroni C., Messina G., Valentini M.P.

Session 12 (16:30 – 16:55) Road Intersections Analysis

Warning sound to affect perceived speed in approaching roundabout: experiments with a driving simulator

Rossi R., GASTALDI M., Biondi F., Mulatti C.

The analysis of roundabouts through visibility

MUSSONE L.

Optimal setting of traffic signals through the artificial bee colony algorithm

Dell’Orco M., Başkan Ö., MARINELLI M.

Session 13 (16:55 – 17:20) Transportation System Monitoring

Annual average daily traffic estimation from seasonal traffic counts

Gastaldi M., Rossi R., GECHELE G., Della Lucia L.

A new classification of Italian ports based on the value added concept

Lupi M., FARINA A.

Session 14 (17:20 – 17:55) Travel Demand II

Experimental analysis of day-to-day route choice dynamics in a three-link network without information provision

MENEGUZZER C., Olivieri A.

Influence of information on users’ behaviour: a day-to-day model for route choice updating

DE MAIO M.L., Vitetta A., Watling D.

The value of en-route information on the accessibility to concurrent transit system services

GORI S., Nigro M.L., Mannini L.

Closure (17.55) SIDT President

ACTIVITY LOCATION AND MOBILITY COSTS

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1 INTRODUCTION

The paper fits into the general themes of land use - transport planning (Nuzzolo and Coppola, 2008a and 2008b) and accessibility (Geurs and van Wee 2004) in urban areas. It's widely recognized in academia the need for integration between mobility and land use policies in accordance with the objectives of environmental sustainability and quality of life in urban areas (Nuzzolo and Coppola, 2007; te Brömmelstroet and Bertolini, 2011). Furthermore, in recent years travel behaviours are changing in urban areas due to the increase in oil prices, the recession of Western economies, the resulting lack of financial resources for public transport subsidies. For this reasons, technicians and scientists are trying to find solutions in the short and long term to make existing transport system more efficient. In this sense the search for integrated solutions including systems engineering, transport and urban planning is a priority not only in the scientific debate but also in the operative field. Despite an extensive literature on the land use-transport interaction has been produced, simple tools for land - use transport integrated planning are not as much used; in particular tools that can support the choices of location of new activities in the definition of urban or regional plans are not widely applied (Hull et al. 2012).

According to this premise, the goal of the work is to develop a tool to support the choices of activities location, which is based on accessibility and transport costs indicators. Assuming that one of the goal of integrated land use – transport planning is the minimization of generalized transportation costs (Nuzzolo and Coppola, 2010), in compliance with the objectives of environmental sustainability and quality of life, the tool computes the “access cost” of activities, providing an estimation in monetary terms of the advantages and disadvantages of locating an activity in a particular zone of the urban area; the tool provides

also thematic GIS maps of territorial activity access cost, which identify the areas where access costs of located activity are lower.

The article is structured into three parts. The first part offers an overview of the literature on land use - transport planning, accessibility, and activity access cost, while the second part describes the methodology for estimating access cost to activities; in the third part we propose an application of the methodology to the metropolitan area of Rome and some conclusion remarks.

2 METHODOLOGY: ESTIMATING THE ACTIVITY ACCESS COST

The methodology for estimating the “access cost” to activities starts from the consideration that an activity entails itself a mobility cost in relation to the trips it generates. These trips are related to the commuting of the activity’s workers (work trips) and to the flows of users attracted by this activity; for example, a shop attracts trips for purchase purpose. To calculate these costs, the activity demand flows to the zone in question, for various available transportation modes, the flows on the network arcs and its related times and travel costs (transport costs for users) can be estimated through a transportation system model (Cascetta, 2009).

The flows on the network links allow also an estimation of the transport external costs, which constitute an important component of the access cost, connected to:

- Environmental pollution
- Noise pollution
- Energy consumption
- Road accidents.

There are other cost components which are related to the management costs of the transportation system, such as maintenance (and construction) of infrastructures or public transport subsidies; these costs are typically funded by transport agencies and local administrations.

The sum of the three cost components described (transport costs for users, external costs for the community and costs for agencies and administrations) of a zone in a given sector (for example shopping) provide the average access cost to that activity. The access cost will be different for each activity category (shopping, education, services, etc..) because each activity attracts specific trips flows, from different origin zones and with different modal share.

Several types of cost indicators can be calculated, as for example the marginal activity access cost, considering just a single new employee located in the zone and constant the distribution of other activities and the supply of transport services and infrastructure, independently to the location of a new employee in the area. Dividing by the number of employees of an area in a given sector, the average access cost (cost per employee) to the activity of that sector is obtained.

The "access cost" allows the analysis and identification of some critical issues related to the activities locations in the study area and can provide useful information to guide the land use planning process.

2.1 The application in the metropolitan area of Rome

The article proposes the application of the methodology to the metropolitan area of Rome, estimating the access cost to new development areas (centralities) located in different suburban areas, as defined by the new Master Plan of Rome with the aim of decongesting the central area and of creating new functional centers. The measure of the access cost for new activities in "centralities" areas is useful to validate or not the location choices proposed by the Master Plan, from an access cost point of view.

3 CONCLUSIONS

The work provides a useful tool to assess the location choices of new activities, estimating the access cost to urban functions using the existing transport supply. This indicator, which is proportional to the spatial impedance to reach an activity and that takes into account the different cost components (internal and external costs), provides a useful indicator for identifying the best location of a new activity in the study area, to which correspond a suitable access cost. The application illustrates the usefulness of the tool for land use –transport planning processes.

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