



New trends in consumer behaviours – a modern approach to urban transportation problems

A. DEWALSKA-OPITEK

UNIVERSITY OF ECONOMICS IN KATOWICE, Faculty of Informatics and Communication, 1 Maja 50, 40 – 287

Katowice, Poland

EMAIL: a.dewalska-opitek@ue.katowice.pl

ABSTRACT

Due to the increasing costs of urban traffic congestion, new trends of consumer behaviour in passenger transportation may be observed. Among those trends three seem to be particularly significant, i.e. collaborative journeys (as a form of collaborative consumption), carsharing and helping other road users via mobile apps (as a form of consumer citizenship behaviour). The theoretic deliberations about the trends have been supplemented by results of direct quantity research presenting respondents' opinions about contemporary consumer behaviours.

KEYWORDS: urban transportation, customer behaviour, new trends

1. Introduction

Efficient transport system, as well as convenient communication becomes important challenges for contemporary cities. They determine the quality of living perceived by inhabitants and become an important element of cost accounting including time and money spent on transport.

The economic value of travel time is the opportunity cost of the time spent on journey, so the reduction of travel time becomes the main goal of transport network users. Travel time losses in passenger transport are frequently observed in crowded cities, which are facing different types of traffic congestion. According to Deloitte's research conducted in 7 Polish metropolitan cities, people travelling by cars (as individual transport) lost in 2014 in traffic jams 11,5 millions PLN daily, about 2500 millions PLN per month, which gives about 3 billion PLN per year. A 10% increase may be observed in comparison to 2010.

New trends in customers' behaviour which bring a significant change in the contemporary transport services consumption model may be the solutions to urban transportation problems. The subject matter of the paper is the identification and description of these trends on the basis of literature studies as well as the diagnosis

of their present and future implementation based on empirical research in the form of direct quantity research. A survey conducted among inhabitants of the Silesian region is the method used in the research. Results allowed for drawing conclusions concerning the sample consumers' behaviour as well as forming general conclusions on the new trends in customers' behaviour concerning urban transportation. Identification of further possible aspects of the research has also been made.

2. Economic effects of the loss of time in urban passenger transport

Urban areas with a high population density are burdened with traffic congestions. Commuting to work or school in the morning and back home in the afternoon (obligatory transport needs) causes traffic peaks. Traffic congestion, defined as a situation in which the demand for the use of infrastructure prevents free movement at the maximum permitted speed of traffic, is a visible sign of overloaded networks of urban transportation [13].

From the economic perspective, time spent in traffic congestion is not productive, so it is an opportunity cost, alternative to gainful work, and may be estimated and calculated. Deloitte and Targeo in a report on traffic congestion in seven metropolitan cities in Poland [5] presented in March 2015 used two criteria of estimation, i.e. time lost in congestion (non-monetary criterion - minutes spent during a workday) and cost of the congestions for drivers (monetary criterion - percentage of a salary lost due to congestion per year). Due to the fact that it is impossible to summarize or to compare these two types of costs, the travel time (a non-monetary cost) had to be estimated as a monetary value.

In order to estimate the economic value of travel time it is necessary to make some simplifications. In practice, very often two sets of valuation are used – working and non-working time. This division helps to calculate more precisely the value of travel time as a whole, because travel time spent in the course of work and outside the work should be estimated differently. The value of working time can be named as the opportunity cost of that time to employer that is generally equivalent to the wages of the employee. However, the type of transport used by the employee should be taken into consideration. Time spent travelling by train can be used to perform some work, while time spent in car cannot, so the value of time spent on journey may not exactly correspond with the salary of the traveller. The estimation of non-working time is even more imprecise and difficult, because it is based on revealed preferences or stated preference analysis which means that real or hypothetical travellers' choices between slower, cheaper and faster, as well as more expensive transport is examined [13].

According to conducted research, people travelling by cars (as individual transport) lost in 2014 in traffic jams PLN 11,5 million daily, about PLN 253 million per month, which gives about PLN 3 billion per year. The detailed data is presented in Table 1.

Table 1. Costs of traffic congestion in 2014 and 2010 (in million PLN)[5]

Metropolitan City	2014			2010		
	Per day	Per month	Per year	Per day	Per month	Per year
Warsaw	14,0	308	3 701	15,7	346	4 155
Wroclaw	13,4	295	3 539	10,4	229	2 750
Cracow	12,0	263	3 161	9,6	211	2 528
Poznan	11,5	253	3 030	13,0	286	3 426
Gdansk	9,2	202	2 428	12,4	273	3 278
Lodz	9,1	201	2 408	7,8	172	2 063
Katowice	11,3	248	2 937	8,7	191	2 290
median	11,5	253	3 030	10,4	229	2 750

A comparison made between 2014 and 2010 shows an average 10% increase of estimated costs, although 3 cities present a visible decrease, i.e. Warsaw, Poznan and Gdansk. Nevertheless, the general conclusion drawn from the report is that drivers either spend more time in traffic jams or incur higher fuel and opportunity costs for the period of four years.

Polish metropolitan cities presented in the report are not extreme case. The world's most congested cities in peak hours are presented in Table 2.

Table 2. Ten most congested cities in the world in 2014 [11]

No	City/ Country	Description
1.	Moscow/ Russia	Peak hour index is 126. This means that the average 30 minute trip in free flow conditions takes 68 minutes during peak hours.
2.	Istanbul/ Turkey	Peak hour traffic index is 108. The average free flow 30 minute trip takes 62 minutes during peak hours.
3.	Rio de Janeiro/ Brazil	Peak hour traffic index is 99.5. The average free flow 30 minute trip takes 60 minutes due to congestion during peak hours.
4.	Tianjin/ China	Peak hour traffic index is 91. The peak hour congestion extends a free flow 30 minute trip to 57 minutes.
5.	Mexico City/ Mexico	Peak hour traffic index is 88.5. The average free flow 30 minute trip takes 57 minutes due to congestion.
6.	Hangzhou/ China	Peak period traffic index is 87. The average 30 minute trip in free flow takes 56 minutes during peak hours.
7.	Sao Paolo/ Brazil	Peak hour index is 80.5. The average 30 minute trip in free flow takes 54 minutes during peak periods.
8.	Chongqing/ China	Peak hour index is 78.5. As a result, a trip that would take 30 minutes in free flow conditions takes 54 minutes during peak hours.
9.	Beijing/ China	Peak hour index is 76.5. A trip that should take 30 minutes in free flow is likely to take 53 minutes during peak hour.
10.	Brussels/ Belgium	Peak hour index is 75. A trip that would take 30 minutes at free flow takes 52 minutes in peak hour congestion.

In order to decrease costs of congestion, various solutions may be undertaken. One is to develop public transport through infrastructure investments or implementation of multimodal solutions supported by smart mobility and ICT. Although it is an important option, it will not be the subject matter of the paper.

New trends of customer behaviour in passenger transport which will be presented in the following part of the paper are other solutions that may already be observed.

3. New trends of customer behaviour in passenger transport

Collaborative consumption is an emerging social and economic phenomenon that is fuelled by development in information and communications technology (ICT), growing consumer awareness, proliferation of collaborative web communities as well as social commerce/sharing [2], [9], and [12]. It may be defined as the peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services [7]. **In collaborative lifestyles**, people with similar needs or interests band together to share and exchange less-tangible assets such as time, space, skills, and money. These exchanges happen mostly on a local or neighbourhood level, as people share

working spaces, gardens, or parking spots. Collaborative lifestyle sharing happens on a global scale, too [2]. Consumers turn to their social networks in which the participants can be consumers, providers, or both. Such consumer behaviours may be driven by enjoyment, economic incentive or reputation, and yet additionally paired with collaboration. Participating in sharing can be emotional and rational, utility maximizing behaviour wherein the consumer replaces exclusive ownership of goods with lower-cost options from within a collaborative consumption. The service may be a source of enjoyment and may also enable gaining reputation among likeminded people.

BlaBlaCar as the world's largest long-distance ridesharing community, valued at 1.6 billion USD can be indicated as an example of collaborative consumption referring to passenger transportation. The main idea of the initiative is to connect drivers and passengers willing to travel together between cities, and share the cost of the journey. Members must register and create a personal online profile, which includes ratings and reviews by other members, social network verification, and rate of response. Profiles of members show how much experience they have of the service, which means that those more experienced, known as «ambassadors», attract more ride shares. It is also important that each user's profile includes comments and recommendations for both drivers and passengers.

BlaBlaCar was launched in 2008 in France and within 10 years it has spread into 20 countries, i.e. Brazil, Croatia, Czech Republic, Germany, Hungary, India, Italy, Mexico, the Netherlands, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Spain, Turkey, UK and Ukraine. The service accessible via the web, mobile devices and also via apps for iOS and Android has exceeded 20 million members in January 2016 [14].

BlaBlaCar is the best known, but not the only service offering collaborative journeys. In Poland drivers and passengers may use other services, like Uber, Otodojazd or Yanosik Autostop [16], but the idea is very similar – drivers and passengers offer and search for journeys. After finding a match they contact each other to arrange all details like costs, meeting points, space for luggage etc. Then they meet and start their shared car journey as planned.

Another form of collaborative consumption referring to passenger transportation is carsharing (US) or car clubs (UK), a model of car rental where people rent cars for short periods of time, often for an hour. It is attractive to customers who make only occasional use of a vehicle, as well as others who would like occasional access to a vehicle of a different type than they use day-to-day.

Carsharing services are available in over a thousand cities in many countries and offered not only by traditional car rental companies, but car manufacturers (e.g. Daimler's Car2Go, BMW's DriveNow, Volkswagen's Quicar), as well as private car owners.

A typical carsharing organization places a network of shared-use vehicles at strategic parking locations throughout a dense city. Members usually reserve shared-use vehicles in advance. At the time of the rental, the users gain access to the vehicles, carry out their trip, and return the vehicles back to the same place they originally accessed them from (this is also known as a “two-way” rental because the user is required to rent and return a vehicle to the same lot during one continuous rental period) [8].

There is also a “one-way” rental model, called multi-nodal shared-use vehicle system in which the vehicles are driven among multiple stations or nodes to travel from one activity centre to another. Such systems may be located at resorts, recreational areas, national parks, and corporate and university campuses. A specific presented shared-use vehicle system model is known as “station cars”. A fleet of vehicles are deployed at passenger terminals and stations in metropolitan areas that are used by commuters primarily on the home – and –work end of a trip. A majority of these systems have been initiated by rail transit operators seeking to relieve parking shortages, increase transit ridership and create a multimodal transport system.

Participants pay a usage fee (typically based on time and mileage) each time a vehicle is used. The carsharing organization as a whole maintains the vehicle fleet (including light trucks) throughout a network of locations, so users in neighbourhoods and business areas have relatively convenient access to vehicles. Usually there is also a small monthly subscription fee, a one-time deposit, or both. Internationally, carsharing organizations are the most prevalent type of shared-use vehicle system. The vehicles are most often placed in residential neighbourhoods; less frequently, they are located in downtown business areas and rural locations [1], [10].

Although the carshare service model has been well established over the past 15 years, significant growth has been observed in the market recently. According to Navigant Research, global carsharing services revenue is expected to grow from \$1.1 billion in 2015 to \$6.5 billion in 2024 [15].

Studies on consumer behaviour allow to observe the so-called “citizenship behaviours”, which may be defined as “voluntary and discretionary behaviour by individual customer that is not directly or explicitly expected or rewarded, but that aggregates into higher service quality, promotes the effective functioning of service quality and promotes the effective functioning of service, products and organizations (e.g., helping another customers or providing suggestions to the service organization)” [6].

Customer citizenship behaviour (CCB) is based on the theory of social exchange where customer reciprocates positive behaviour from a sense of personal obligation or gratitude. Among various dimensions of CCB identified and defined by researchers [3], [4], [17], one seems to play an important role in the context of customer behaviour in passenger transport, i.e. helping other customers while using a mobile app for road navigation (GPS app). Due to data optimization in real time, users are informed, and inform other road users about possible traffic difficulties and burdens, congestions, traffic jams and road works, as well as speed controls, speed detectors and police patrols. All the information about current situation observed on the roads is provided by the application users who build a social network of traffic participants. Especially information about congestion may allow other car users to avoid traffic jams and save time and money, which sums up to economic effects of time loss in urban passenger transport. There are several apps available in Poland dedicated to road users. Yanosik, Coyote, RadarStop or AntyRadar are the most popular.

4. Practical verification of the new trends in customer behaviour in urban passenger transport – direct research results

The theoretic deliberation is supplemented by results of research that has been conducted in December 2015 and January 2016 on the basis of direct quantity research. The method used in the study was a survey among 241 inhabitants of the Silesian region as subjects of the research. Table 3 illustrates the sample characteristics.

The research has been conducted on a small and unrepresentative sample and thus does not allow for drawing any general conclusions. However, the research in question made it possible to become familiar with the customers' opinions and attitudes towards the new trends in consumption in passenger transport.

Table 3. Sample characteristics [own study]

Categories	Total sample (%)	Categories	Total sample (%)
Gender: female	48	Professional activity: working	63
male	52	not working	37
Age: 18 – 24 years	26	Education: elementary	3
25 – 34 years	36	vocational	17
35 – 44 years	19	secondary	35
45 – 54 years	11	higher	45
55 – 64 years	7		
65 and more	1		

Majority of survey participants (62%) declare that they own a car. The respondents were asked to indicate the purposes of using their car. The answers of the respondents indicate that they use their cars daily to get to work and back home (89%), they use them daily for other purposes not connected with the professional work, like shopping, personal services etc. (63%), and for long distance journey (53%). The answers of the respondents are presented in Figure 1.

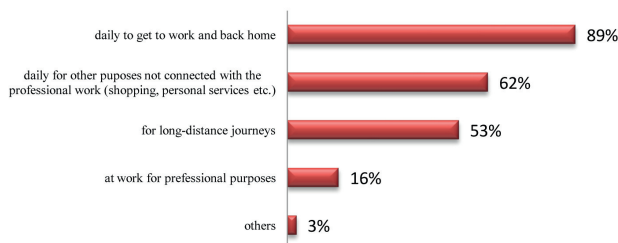


Fig. 1. Graphic presentation of respondents' opinion on the purposes of car usage [own study]

When asked whether they would be willing to accept fellow passengers (apart from family members and friends) who have the same destination, the respondents declared they would take them occasionally, for long-distance journeys or for everyday journeys

to work and back home (71%). Only a third of respondents (29%) would not decide to accept or invite a fellow passenger. Respondents' opinions are presented in Figure 2.

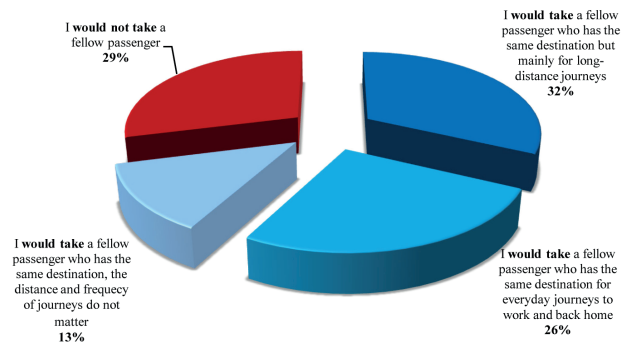


Fig. 2. Graphic presentation of respondents' opinion on their willingness to accept fellow passengers [own study]

64% of respondents declare they would participate in collaborative journeys as passengers. The individuals who were open to this form of passenger transport, either as drivers or as passengers, were mainly young employed people (aged 18 – 34) with higher education. Only a quarter of respondents declared they had experience in that area, while using mostly two on-line services, i.e.: BlaBlaCar or Yanosik Autostop.

Respondents were asked what the reasons for collaborative journeys were or would be. Both drivers and passengers indicated the journey costs reduction as the most important factor. Other people's behaviour is ranked second and third – pleasure of travelling in a nice company. Respondents' opinions are illustrated in Figure 3. The question had a form of a conjunctive cafeteria, so answers do not sum up to 100 per cent.

Drivers, who were willing to participate in collaborative journeys, also declared they would like to be helpful to other people, while passengers indicated convenience of travel.

Those respondents, who declared they had not participated and would not participate in future in collaborative journeys indicated various reasons, which generally focused on two problems, i.e. security and negative experience of a friend or family members. Answers like: "lack of security", "I won't feel comfortable and safe", "I had a negative experience in that field", and "My friend used this form of journeys and did not recommend it" were the most common.

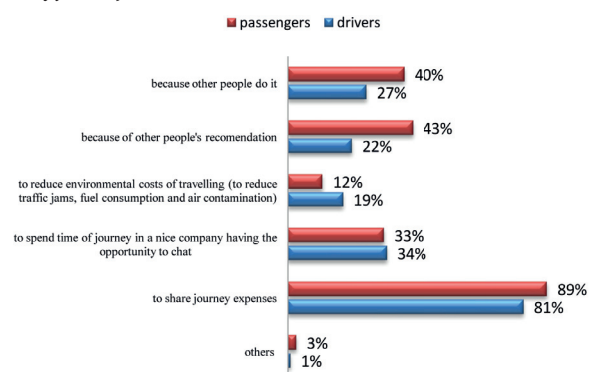


Fig. 3. Graphic presentation of respondents' opinions on factors influencing their willingness to participate in collaborative journeys [own study]

The respondents were asked whether they knew the carsharing concept. From the answers of the subjects it can be indicated that this concept is rather popular among the respondents. 84% of respondents declared knowledge of carsharing, but only a third used this form of transport (Figure 4).

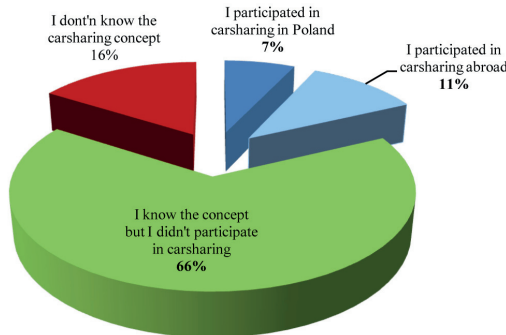


Fig. 4. Graphic presentation of respondents' knowledge and implementation of carsharing [own study]

Respondents who had declared participating in carsharing were asked about their reasons. They mainly indicated situations of the so-called multimodal transportation, i.e. using trains or planes for long distance journeys and then additionally cars in the carsharing model. They find this multimodal transportation popular especially in foreign countries.

Requested to evaluate carsharing as an alternative means of transportation, the respondents grade it as "good" or "very good" (54% and 26% respectively). 20% described it as "neither good nor bad". The weighted average of responses allowed for qualifying this evaluation as "good".

The participants in the survey were asked whether they used mobile apps enabling using and sharing on-line information about traffic. The vast majority of them (95%) declared they did, mostly apps like *Yanosik* (62%), *Coyote* (22%) and *Rysiek* (13%). 5% of the respondents used traditional navigation devices.

Those who declared on-line participation in social network of road users, stated that they usually used the app to pave a route (97%), to get or share information about traffic congestions and other burdens (84% and 72% respectively). The respondents' opinions are presented in Figure 5. The question had a form of a conjunctive cafeteria, so answers do not sum up to 100 per cent.

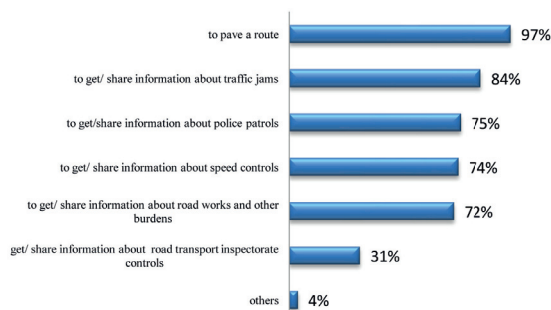


Fig. 5. Graphic presentation of respondents' opinions about helping other road users via mobile apps [own study]

Asked about the reasons for using mobile apps to help other road users, respondents declare they "get and thus share current and trustworthy information about traffic", "information may be relied on", and also for the "convenience" and "safety".

5. Conclusion

Consumers have to face increasing traffic congestion, especially in big cities. It involves increasing costs of journeys. People travelling by cars lost about 11 million per day, which gives 3 billion per year in 2014. Car users lose money and time, which may also be presented in monetary units as an opportunity cost. For these reasons new trends in consumer behaviours may be observed within the scope of passenger transportation. As it was stated in the paper, three trends seem to be particularly significant.

One of them is collaborative journey as a part of collaborative consumption. People tend to share free space in their cars, invite fellow passengers or offer their companionship (and money in a form of co-covering the travel cost). Due to this trend, travellers have lower costs and fewer cars on roads. This means lower congestion as well as lower environmental damage.

Another identified and described trend is carsharing as a form of car rental where people rent cars for short periods of time, often for hours. It is attractive to customers who make only occasional use of a vehicle, as well as others who would like occasional access to a vehicle of a different type than they use day-to-day.

The third trend that was a subject matter of the paper is helping other consumers as a form of consumer citizenship behaviour. Road users use and share traffic information on-line, making social networks of prosumers, which means being information or service consumer and supplier at the same time.

It needs to be stated that all described trends are supported or even delivered to the market due to information and communication technologies and could not appear without them.

According to information obtained in the course of direct examination conducted among the citizens of the Silesian region, one of the identified trends seems to be very popular and often implemented by the respondents, i.e. helping other road users via mobile apps like *Yanosik* or others. Vast majority of respondents declared they had used it. Also many respondents implement collaborative journeys either as a driver offering a lift or as a fellow participant (a passenger). Carsharing is occasionally implemented, but still well known – only 18% of declared using it, but mostly abroad.

The analysis of the collected empirical material allows for pointing at the existence of new trends of consumption in passenger transportation. Of course, the study was regional in nature, and the results may not be generalized. It would be cognitively interesting to make a comparison of existence of the identified trends in other Polish regions, or even abroad. This indicates, therefore, the trend of future research on new trends of consumer behaviour in passenger transportation.

Bibliography

1. BARTH M., SHAHEEN S.: Shared-Use Vehicle Systems: A Framework for Classifying Carsharing, Station Cars, and Combined Approaches, Transport Research Record 2014, <http://trrjournalonline.trb.org>, 2014.
- [2] BOTSCHAN R., ROGERS R.: Beyond Zipcar: Collaborative consumption. Harvard Business Review, 88(10), 2010.
- [3] BOVE L.L., et al.: Service Worker Role in Encouraging Customer Organizational Citizenship Behaviour. Journal of Business Research, p. 63, 2009.
- [4] CARMELI A.: Perceived External Prestige, Affective Commitment and Citizenship Behaviours. Organizational Studies, Vol. 26(3), 2005.
- [5] Deloitte, Targeo 2015: The report on traffic congestion in seven Polish cities: Warsaw, Lodz, Wroclaw, Cracow, Katowice, Poznan and Gdansk, <http://www2.deloitte.com>, 2015.
- [6] GROTH M.: Customers as Good Soldiers: Examining Citizenship Behaviours in Internet Service Deliveries. Journal of Management No31, 2005.
- [7] HAMARI J., SJÖKLINT M., UKKONEN A.: The Sharing Economy: Why People Participate in Collaborative Consumption? Journal of the Association for Information Science And Technology, June, 2015.
- [8] KATZEV R.: Car Sharing: A New Approach to Urban Transportation Problems, Analyses of Social Issues and Public Policy, Vol. 3, No. 1, 2003.
- [9] KAPLAN A.M., HAENLEIN M.: Users of the world, unite! The challenges and opportunities of Social Media. Business Horizons, 53(1), 2010.
- [10] MARTIN E., SHANEEN S., LIDICKEJ J.: Carsharing's Impact on Household Vehicle Holdings: Results From a North American Shared-Use Vehicle Survey, e-Scholarship University of California, available at <http://eprints.cdlib.org/>, 2010.
- [11] TOM Traffic Index Report 2014, available at www.washingtonpost.com [date of access: 12.12.2014].
- [12] WANG C., ZHANG P.: The evolution of social commerce: The people, management, technology, and information dimensions. Communications of the Association for Information Systems, 31(1), 2012.
- [13] WAŻNA A.: Economic effects of time loss in passenger transport – evidence from selected polish cities, Transport Problems, Vol.10, Issue 2, 2015.
- [14] www.blablacar.uk [date of access: 12.12.2014].
- [15] www.navigantresearch.com [date of access: 12.12.2014].
- [16] www.softonet.pl [date of access: 12.12.2014].
- [17] YI Y., GONG T.: Customer Value Co-creation Behaviour: Scale Development and Validation,” Journal of Business Research, Vol. 63, 2012.