



Wojciech Bąkowski

*Faculty of Management and Economics of Services, Szczecin University, Poland*

## PROBLEMS OF EFFECTIVENESS OF IMPLEMENTATION OF THE PUBLIC TRANSPORT INTEGRATION PROCESS AT A REGIONAL LEVEL

### Abstract

It is generally established that the integration of collective transport in several counties brings benefits to the passenger as to the price of the service, quality and travel time. The aim of the article is, basing on the premise of the theory of economics and organization, to present the view that the integration process encounters barriers limiting its positive effects. Barriers are on the side of the characteristics of the public transport sector itself, the organization, the tariff-ticket system, and the approach of local government authorities (local politicians) and the role of intellectual capital. The article indicates the difficulties in measuring the effectiveness of the integration process.

**Keywords:** regional public transport, effectiveness, integration

### 1. Features of the public transport sector in the urban agglomeration

The public land transport sector consists of carriers (operators) serving rail traction (railways, trams) and bus traction. In railway, tram and bus traction, carriers are mainly municipal or State Treasury. The division of the public transport sector in servicing the urban agglomeration is important due to the risk of business operations and the freedom to find new markets and development expansion.

Municipal enterprises (as internal entities) in the transport service of the urban agglomeration operate on the so-called "closed market". As a result, they are not afraid of competition, they know in advance time (several years) the volume of transport work and the revenues they will receive for its performance. The revenues of these carriers are not dependent on the frequency of passengers and tickets sold. The operator does not need to conduct marketing research. Such a system

of administering municipal operators in the urban agglomeration eliminates business risk and does not induce any innovations in passenger service. Municipal carrier (internal entity) cannot compete on the regional transport market.

The municipal government by means of the organizer determines what tasks each operator should perform, sets the passenger tariffs/prices for a period of 3–5 years, the way of ticket distribution. The local government (owner of the carrier) bears the risk of the amount of the deficit arising between the revenues from the sale of tickets and the payment to the operators. The lack of independence of municipal carriers (internal entities) indicates that the integration of transport in the area of several local governments is dependent only on the political will, knowledge and skills of those administering these local governments.

## 2. Activities that make up the integration process

The concept of integration is not explicitly defined e.g.: “integration is the extent to which the units of the organization have to cooperate in a coordinated way”<sup>1</sup>, or “integration is the merging of elements and creating from them the system, organization”. In turn other scientists such as e.g.: P.R. Lawrence, J.W. Lorsch<sup>2</sup> “talk about integration instead of the date of coordination”. The diversity of understanding of integration makes it extremely difficult to determine the processes and measurable benefits that are obtained through the integration of collective transport in the area of several local government administration units. Integrations are considered as a process that is to contribute to reducing disparities and to co-ordinate many collective transport operators in a coordinated way. In academic publications on management, little attention is paid to this process. Briefly, it is just said that integration concerns merging and depending on many circumstances it is carried out in the forward direction (with suppliers) or backwards (in the sphere of recipients).

Professor G. Dydkowski presented extensive and comprehensive scientific deliberations and research on the integration of urban transport among many national scientists. However, the author states that “in current research in Poland there is a lack of assessments of integration in terms of costs and benefits, identification and characteristics of integration factors, and there are no models of financial flows and settlements between participants of integrated transport systems”<sup>3</sup>. In terms of standardization of the elements of the integrated urban transport network, a rich set of assessment tools was presented by K. Solecka in her doctoral dissertation<sup>4</sup>.

The process of integrating the collective transport except from the mergers of municipal operators is carried out with the participation of local governments independent of each other, even those that do not have their own operator. The integration of transport should be carried out through:

<sup>1</sup> R.W. Gryffin, *Podstawy zarządzania organizacjami*, PWN, Warsaw 2004, p. 385.

<sup>2</sup> J.A.F. Stoner, R.E. Freeman, D.R. Gilbert, Jr., *Kierowanie*, PWE, Warsaw 1997, p. 313.

<sup>3</sup> G. Dydkowski, *Integracja transportu miejskiego*, Akademia Ekonomiczna, Katowice 2009, p. 32.

<sup>4</sup> K. Solecka, *Wielokryterialna ocena wariantów zintegrowanego systemu miejskiego transportu publicznego*, Cracow University of Technology, Cracow 2013.

- coordination in setting transport tasks for all operators and merging traffic flows into one entity (timetables, connections between participating operators) and controlling transport processes. Transport capacity and safety related activities are also being coordinated;
- standardization including the setting of norms and standards for linear and point infrastructure and means of transport. Standardization is primarily subject to a common tariff and ticket distribution channels, but also rules for making additional payments by individual local governments and the division of these subsidies for operators. It is advisable that all participants of the integration meet the requirements of standards, the quality of operation.

Each of these activities can be described, but it is extremely difficult to assign a specific measure to them. "The purpose of each of these activities is to make integration contribute to the added value for the passenger". The main point is to make the transport processes (especially the speed of reaching the destination) and complementary services (ticket, tariff, information, parking, park and drive, etc.) together constitute a substitute with a positive value for a household with a car. For a household to value the collective transport more than travelling its own car.

Passengers living in a specific administered region assess the integrated public transport. In many of his works, Drucker emphasizes that "the starting point for work on a policy and management strategy must be information about the values and needs of potential customers of the company"<sup>5</sup> (in this case it is a potential passenger). A significant parameter of assessing the value of a service is the time of achieving travel destinations by means of collective communication, in relation to driving own car and spending of the passenger's own energy on the continuation of intentional movement. A simple but not very precise measure is to compare the frequency of transported passengers by collective transport before and after the integration.

In turn, the implementation of integration measures requires financial expenditures on investments, organization and service of integrated public transport in a given geographical area. Measuring financial expenditures and determining the effectiveness of integration is not methodically elaborated in economic sciences, as it is the case in determining the investment expenditures and the expected return on capital with regard to risk.

It is relatively easy to determine the expenditures on infrastructure elements involved in integration (stops, sheds, loops, etc.) and movable assets (rolling stock, IT hardware and even training). In this case, the risk results from the use of these tangible and intangible investments in a rational way. An example are mobile ticket devices inside vehicles. Their use is negligible by passengers and is therefore not applicable in many European cities. The incurred expenditures on investments and operations of collective transport integration may not always lead to a reduction of costs incurred before the integration of public transport in the region.

An important feature of integrated collective transport is the restriction of intra-industry and inter-industry competition. The lack of competition in the long run leads to the weakening of the dynamics of changes within the passenger

<sup>5</sup> P. Drucker, *Zarządzanie w XXI wieku*, Muza, Warsaw 2000, p. 29.

transport system, because stagnation occurs. The impulse of innovative changes can only be given by the administrative unit that “manages” the integration process.

### 3. Organizing transport integration at the regional level

Integration in both the design and the process of operation should be implemented by a specialized organizational unit. This unit should be staffed with a human team with an appropriate knowledge, equipped with modern information and communication technology (IT) and having the authority to act as an “integrator”. The organizational unit should be legally located in the structure of local government. The legal form should be adapted to the size of the geographical area where the integration of public transport is undertaken. Examples are provided by practice (a communal union, a metropolitan union, an organizer at the level of a county or several counties). There are no theoretical premises to indicate what organizational and legal form may have an “integrator”<sup>6</sup> – the organizer, be it a private-public partnership (PPP), or a municipal company, or a budgetary company, or a private investor. It is advisable that the legal form of the organizer itself allows a business approach to meet the set tasks of the integrated transport systems at a regional level.

In any case, the strategic and tactical tasks facing the integration process are developed by a specialized organizational unit, but the final version of these solutions is approved by the authorities of the participating territorial governments. The exercise of organizational power in the scope of integrating public transport requires the proper value of intellectual capital and material capital financing the project and the integration process. The organizer, in accordance with the requirements of the new economy, should have adequate intellectual capital, whose core is knowledge and IT technologies. With the significant potential of intellectual capital, it is possible to rationally realize:

- 1) the design of the regional public transport system in these ranges:
  - a) material: communication infrastructure, rolling stock, money flow paths, passenger flows,
  - b) informative: timetables, tariff prices (approved by the local government), passenger information, organizational and legal regulations in relation local government – organizer – operator – passenger,
  - c) setting standards-parameters, quality of offered products;
- 2) management of the integration process, i.e. operational planning of the network timetable, organization – coordination and assignment of tasks to operators, control of transport performance and evaluation of the value of products sold; offered transport lines;
- 3) regulations on the flow of money between the passenger, ticket distributors, local government budgets, operators and other stakeholders;

---

<sup>6</sup> In the further part of the article, the name “integrator” will be replaced with the commonly-accepted name of the organizer.

- 4) developing change strategies in the field of: telematics, the structure of new rolling stock, availability of passenger products, virtualization of the ticket system, execution control, creating added value for the passenger.

The basic component of intellectual capital is human capital, i.e. employees with knowledge about:

- methods of determination, quality (access, availability, safety, etc.) and tariff prices of products that will be in demand with potential passengers on the local regional market;
- use of appropriate algorithms and IT techniques in the design of a communication network, timetable planning, distribution of fares (“ticket”) and availability of information for the passenger. A similar scope of knowledge and skills is necessary to determine the demand, the amount of revenues, costs, financial settlements, and adjustments to the current activity;
- introducing innovative changes to the passenger transport system, in order to constantly create new values added for passengers.

An element of intellectual capital is social capital, defined as knowledge accumulated and developed by means of relations between employees, partners, clients and suppliers<sup>7</sup>. It is generally about identifying sources from which the necessary information will be collected to design, plan and modify the collective transport system in the region. The regional organizer should have a network of information connections between all clients and other elements of the environment. The most important bond is the bond with the passenger – the customer. These ties make it possible to conduct a dialogue with passengers (e.g. via the Internet, skype, telephone, correspondence, occasional collective meetings). Information ties with clients allow for taking actions called managing relations with passengers (CRM). The management of passenger relations is ultimately a very good understanding of passenger demand. There is also a knowledge of methods in the management of “demand for driving your own car”, as a substitution service for public transport

The last element of intellectual capital is the organizational capital, which includes: organizational culture, strategy and structure of the organizer and acquiring new knowledge. The basic task is to manage knowledge and acquire new knowledge so that you can introduce new technological solutions, e.g. using new IT.

#### **4. Impact of clients on the implementation of the integration of public transport at the regional level**

The need to integrate public transport in the area of the urban agglomeration or several counties or the metropolitan area or the communal relationship is convinced by the local authorities, operators and the local community. The most often emphasized argument in the assessment of local politicians is the possibility of paying for one single “integrated ticket” throughout the area served by collective transport. The fulfillment of this postulate as demonstrated by practice is not implemented

<sup>7</sup> A. Baron, M. Armstrong, *Zarządzanie kapitałem ludzkim*, Oficyna a Wolters Kluwer Business, Cracow 2008, p. 27.

effectively. Urban agglomerations serviced by one or several bus carriers gain full success.

The reason for limiting the effectiveness of implementing full integration is to defend the interests of each local government involved in transport integration. The lifeblood of integration is the cash flow in which the following are involved: passengers (source of money), local government administrations (source of money), organizer of integration (money flow regulator), operators (money recipients) and organizations providing complementary services (money recipients). Each of the clients assumes that as a result of integration, they will gain benefits from this process. Since the public transport operation is by definition deficient, the main source of the stream of money are subsidies from local government budgets and a much smaller source are the revenues from tickets sold to passengers. These two sources of the stream of money should cover the amount of payment for the services of the "integrator" – the organizer, complementary services and transport activities of the operators.

Balancing the flow of money is reduced to two economic category equations:

- 1)  $\sum^n Db + \sum Pb = \sum_1^m Pwkm + Kor + Pk$  (the level of local government administration);
- 2)  $\sum_1^m Pwkm - \sum_1^m K = \sum_1^m Zop$  (level of performers);

where:

$Db$  – subsidies from local government budgets,

$Pb$  – revenues from tickets,

$Pwkm$  – payment to operators for transported in  $wkm$  (revenues of operators),

$Kor$  – costs of the organizer,

$Pk$  – other costs,

$K$  – operator costs,

$Zop$  – gross profit of operators,

$n$  – number of local governments,

$m$  – number of operators.

Balancing the flow of money rests only on the side of local governments, because the planned cash amount from the sale of tickets, as a rule, deviates from the real income in minus and exceptionally in plus. Revenues from tickets sold depend on the attendance and structure of travellers and so far have a downward tendency. In turn, operators and other service providers increase the valuation of their services, which results in imbalance and all local governments from their own budget balance the balance of the flow of money.

Individual governments are very cautious in deciding how to spend money on investments necessary to start integration and incur the operating costs of integrated public transport. Administrative units of local governments base their findings on the opinions of local politicians (councilors) supported by the information of their own operator. The amounts of these expenditures are compared with expenditures previously incurred and often indicate an increase in expenditure from the local government budget. That is why, on the joint local government forum, the expenses for integration are subject to disputes and negotiations. The question is why "our" local government is to incur so much expenditure on integration in comparison to other local governments or expenses incurred before integration?

Many residents may not take advantage of the anticipated scope of integrated mass transport services (they will still use a car or bicycle), or the number of inhabitants will decrease and the age structure of the population will change, which in terms of incurred expenses for investments and operations reduces economic efficiency integration.

On the other hand, the operators participating in the integration system want to obtain a possibly wider range of outsourced transport services in relation to the state from before integration. Here the problem of rationalization of communication connections and their transport service arises. The essence of integration is the rationalization of operation. Thus, through the coordination of transport tasks, it is possible to reduce the sum of vehicle kilometers traveled (eliminating crossed transport, reducing the sum of empty runs etc.), without reducing the frequency of running vehicles on the network of communication links. Rationalization will result in a reduction of the total number of vehicles for transport services, and thus reduction of revenues by a particular operator, and possibly a rise by other operators.

## **5. Tariff-ticket barrier in the implementation of transport integration in the region**

In each innovative system change, designers and decision makers encounter limitations and barriers to their implementation. While the limitations are relatively easy to overcome, the barriers prevent innovations. The tariff-ticket systems used in Poland's agglomerations are just such a barrier to integrating transport in the region. The tariff-ticket system was supposed to contribute to three goals:

- provide privileges in fees to certain population groups when using public transport services; in extreme cases, the collection of fees from all residents was discontinued;
- increase the availability of tickets by expanding ticket distribution channels;
- motivate car owners to use public transport more often.

The extensive system of distribution channels and price privileges in the tariff for several groups of passengers differs in the area of each municipality participating in the integration of mass transport. In addition, participation in the integration of rail transport (regional, suburban train) is possible where the tariff is "unchangeable". Hybrid system was created in the field of price information carriers (money, paper, various cards, information on a mobile phone) and many price rates (e.g.: 24/7, concessionary, temporary, depending on the speed of travel, separate for rail transport, family, city cards, Sunday collective, etc.) at various points of purchase (driver, stationary ticket machine, mobile ticket machine, ticket points). In addition, there is a relative independence of IT software in each municipality and special "interfaces" should be built to integrate the process of distribution and information on tariff assessments. This whole complexity should have the same standards according to the recommendation of integration theory. Building a matrix with tariff rates and types of ticket purchase as well as the method of ticket cancellation indicates hundreds of possibilities that can be used by a group of passengers traveling

by public transport. The tariff-ticket system and the distribution system required investment costs and costs for operation and maintenance. The integrated system should maintain the simplicity of solutions. In many European cities much simpler solutions are used, in which the electronic medium dominates and the purchase of a traditional ticket takes place in three types of sales: driver-bus, stationary ticket machine, special ticket sales points operated by the organizer of transport. Mobile ticket machines inside the vehicle are not used in European cities.

## Conclusions

Operators' activity in servicing public transport is characterized by relatively stable regular transport tasks and the lack of competition and planned deficit are features that favour the integration process. However, the following conditions must be met in order for the integration process to proceed effectively:

- the organizer's unit should have a human team with a high level of intellectual capital;
- bring standardization of elements subject to the integration of the transport system, especially the ticket-tariff system;
- negotiate a consensus in determining the expenses for the project, investments and the operational process of integrating regional public transport among the participating local governments;
- it should be clearly shown that integration will bring advantageous utility to a large population of passengers.

Practical observations indicate that failure to meet these organizational and economic conditions in the integration of public transport will take several years and will not meet the expected benefits expressed in the form of added value.

## References

- Baron A., Armstrong M., *Zarządzanie kapitałem ludzkim*, Oficyna a Wolters Kluwer Business, Cracow 2008.
- Drucker P., *Zarządzanie w XXI wieku*, Muza, Warsaw 2000.
- Dydkowski G., *Integracja transportu miejskiego*, Akademia Ekonomiczna, Katowice 2009.
- Gryffin R.W., *Podstawy zarządzania organizacjami*, PWN, Warsaw 2004.
- Solecka K., *Wielokryterialna ocena wariantów zintegrowanego systemu miejskiego transportu publicznego*, Cracow University of Technology, Cracow 2013.
- Stoner J.A.F., Freeman R.E., Gilbert D.R., Jr., *Kierowanie*, PWE, Warsaw 1997.

## Corresponding author

Wojciech Bąkowski can be contacted at: wojciech.bakowski@wziewu.pl