



POLICY LEARNING IN INFORMATION TECHNOLOGIES  
FOR PUBLIC TRANSPORT ENHANCEMENT

## GOOD PRACTICES – PUBLIC TRANSPORT FLEET MANAGEMENT SYSTEMS

INFORMATION ABOUT THIS GOOD PRACTICE IS PROVIDED BY THE  
INSTITUTE OF LOGISTICS AND WAREHOUSING (ILIM, PP5)

## DEMAND RESPONSIVE TRANSPORT

### General information

#### **Description**

In order to better customize PT offer to citizens' needs the city of Krakow has introduced and tested a new demand responsive transport service in a chosen area of three districts. The DRT service in Krakow is the first flexible PT service on the national scale. The implementation of the service was based on the technology and know-how transfer.

In 2005 with the start of the CiViTAS/CARAVEL Krakow decided to implement innovative, flexible public transport based on the experience of Genoa's DRINBUS. The main objective of demand-responsive transport (DRT) in Krakow was to better serve passengers by giving them more personalised service that could be adjusted to their actual needs regarding journey time and destination, and without generating significant costs for the service launch and daily operation. The DRT service in Krakow, called Tele-Bus, was launched in July 2007 with good results.

The launch of the Tele-Bus service in Krakow was based on technology and know-how transfer from Genoa. This kind of public transport flexible service with different target groups (e.g. people with reduced mobility, students travelling to schools, etc.) is successful in many European countries.

Tele-Bus is "many to many" public transport service with fixed stop points and flexible routes and timetables. It operates every day in the southeastern part of the city and during defined operating hours.

#### **Background and Context**

The DRT service in Krakow, called Tele-Bus, was launched in July 2007 after the transfer of technology and know-how from Genoa to Krakow. The preparation of the service operating design, adaptation of the software for managing flexible service, and staff training were all conducted in collaboration of Polish and Italian CARAVEL project partners.

The new DRT service developed gradually during the first year, from 300 clients per month in the first quarter to more than 2,000 passengers in January 2008 and a subsequent stable monthly average of around 1,700 TELE-BUS users.

The daily DRT service operation is managed by Transport Dispatch Center – a part of MPK (Miejskie Przedsiębiorstwo Komunikacyjne – PT operator in Krakow) organizational structure. DRT clients contact dispatchers by phone using a special free line dedicated only for DRT services. Dispatchers collect the information from passengers, input data to the system, the system plans routes and output information is given to TELE-BUS drivers. The only limitation from the passengers' point of view is fact that an order must be placed at least 30 minutes before the planned start of the trip. The communication between TDC and drivers is based on mobiles phones and private radio network.

Operating hours:

Tele-bus service:

- Monday – Friday from 8.00 to 23.00
- Saturday – Sunday from 6.00 to 23.00

Transport Dispatch Centre:

- every day from 7.30 to 21.00

## Policy design details

### *Policy Design Steps and Timing*

Stages of measure implementation		
No.	Description of the stage	Time frames
1	Analysis and research on Genoa DRT service	March – October 2006
2	Work on operating design	November 2006 – May 2007
3	Preparation of marketing campaign	April 2007– June 2007
4	Service model designing	11/06/2007 – 18/06/2007
5	Software adaptation, installation and training	March 2007– June 2007
6	Preparation and execution of communication and marketing campaign	May 2007– July 2007
7	Start of the transport dispatch center	July 2007
8	Start of the service operation (first bus run)	July 2007
9	Service performance and monitoring	July 2007 – January 2009
10	Survey on the Tele-Bus users (preparation, execution and analysis of results)	March 2008 – July 2008
11	Work on the Polish version of the software for managing flexible PT service	March 2008 – December 2008

### *Actors Involved*

- The idea of DRT service in Krakow was realized by CARAVEL project partners:
- Miejskie Przedsiębiorstwo Komunikacyjne SA w Krakowie (MPK) – PT operator in Krakow responsible for the Tele-Bus implementation and daily performance as well as management of the Transport Dispatch Centre;
- Public Transport Authority – municipal entity responsible for the organization of public transport in Krakow agglomeration, the party of contract for public service provision signed with MPK;
- AMI S.p.A (Genoa, Italy) – CARAVEL project partner – giving support to MPK in introduction of flexible service;
- Softeco Sismat (Genoa, Italy) – a provider of the DRT technology – software for managing flexible transport services.

## Implementation details

### Implementation Steps and Timing

**2005:** Krakow decided to implement innovative, flexible public transport based on the experience of Genoa's DRINBUS.

**June 2007:** The service covers three districts: Rybitwy, Podwierzbie and a part of Biezanów. This area consists of residential and industrial zones of low population density. Conventional service here is not efficient and runs infrequently.

**March 2009:** Following the request of both already gained and potential clients the operator doubled the DRT network, covering Płaszów district.

### ICT/Infrastructures needed

- Planning and Management System
- Application for terminals for in-vehicle applications
- GPS
- Communication system

Call center had to be organized, equipped in online communication with buses infrastructure. GPS terminal with direct connection with call center for every DRT bus (so called "green" bus).

Terminals for in-vehicle applications. Driver support through graphic display and maps, Global Positional System (GPS), communication with monitoring headquarters and service management.

### Human Resources

Two operators work on one shift (two shifts system) in Transport Dispatch Center.

Numbers of drivers depends on actual demand and the stage of the DRT development.

## Supporting Mechanism

### Awareness/Information Campaigns

The innovative character of the Tele-bus required a well-planned communications and marketing campaign targeted at inhabitants of the service area. The main objective of the campaign was to let potential clients know and understand the rules of the flexible service.

Start of every Tele-Bus development stage was advertised and the meetings with interested passengers were organized.

**Obszar funkcjonowania linii tele-bus**

**Co to jest tele-bus?**  
Tele-bus to rodzaj usługi transportowej już od wielu lat funkcjonującej w takich krajach europejskich jak Włochy, Szwecja czy Finlandia, której zaletą jest duża elastyczność. Od tradycyjnego transportu miejskiego różni się tym, że przy jej realizacji nie obowiązują żadne rozkłady jazdy, a trasy przejazdów kształtowane są wyłącznie od aktualnych potrzeb klientów.

**Dlaczego tele-bus będzie lepszym?**  
Tele-bus będzie obsługiwał ściśle określone ulice i przystanki autobusowe w rejonie Rybitw i Podwierzbia, zgodnie z załączoną mapką.

**Co daje pasażerom nowa usługa?**  
Dzięki usłudze tele-bus pasażer:  
► Zyskuje możliwość ustalenia z przewoźnikiem czasu rozpoczęcia lub zakończenia podróży. Zatem nie musi dostosowywać się do rozkładów jazdy.  
► Ma dowolność wyboru przystanku początkowego i końcowego podróży w obszarze obsługiwanym przez tele-bus.  
► Nie traci niepotrzebnie czasu na przystanku w oczekiwaniu na przyjazd autobusu.

**Od kiedy będzie działał tele-bus?**  
► W dniu 3 lipca zostanie uruchomiona dyspozycja tele-bus gdzie pod bezpłatnym numerem telefonu 0 800 54 17 17 lub 012 254 17 17, z telefonów komórkowych (płatnie wg stawek operatora) dyspozytorki przyjmować będą pierwsze zamówienia od Klientów jak również udzielać dodatkowych informacji na temat usługi.

**► 14 lipca, na ulicy w rejonie Rybitw i Podwierzbia wyjedzie pierwszy tele-bus!**

**Uwaga!**  
W związku z wprowadzeniem usługi tele-bus od 14 lipca regularne linie 157 i 158 będą kursowały wyłącznie w dni powszednie, w godz. od 5.15 do 7.00. W pozostałe dni i godziny kursy linii 157 i 158 zostaną zawieszony.

**Jak wygląda tele-bus?**  
Tele-busy są pomalowane na charakterystyczny zielono-niebieski kolor, na burtach mają numer, pod którym należy zamawiać usługę. Zatrzymują się na tych niebieskich przystankach MPK, na których są również zielone oznaczenia tele-bus.

**W jakich godzinach kursują tele-busy?**  
poniedziałek - piątek w godz. od 5.00 do 23.00  
sobota - niedziela w godz. od 6.00 do 23.00

**Kiedy można zamawiać tele-busy?**  
Zamówienie na autobus można złożyć wyłącznie telefonicznie, pod numerem 0 800 54 17 17 lub 012 254 17 17, codziennie od godziny 7.30 do 21.00.  
Zamówienie tele-bus można zgłaszać:  
► w dzień podróży, jednak najpóźniej 30 min. przed jej planowanym rozpoczęciem,  
► na dowolny dzień w bieżącym tygodniu,  
► na dni w kolejnych tygodniach, w tym przypadku pasażer musi zadzwonić ponownie w sobotę lub niedzielę poprzedzającą tydzień, w którym ma nastąpić realizacja usługi po to, by poznać dokładny czas przyjazdu autobusu na ustalony przystanek.

**Zamówienie usługi**

Bezpłatne połączenie  
**0 800 54 17 17**  
Doradztwo z telefonów komórkowych  
**012 254 17 17**

Tele-Bus flyer (source – MPK data)

The presentations of the “green” buses have been organized during events connected with local public transport. One of the most powerful tool of Tele-Bus promotion was/is the word of mouth marketing.

**Partnerships/Key Supporting Stakeholders**

- Krakow inhabitants – mainly those living in the DRT service area as well as commuters.
- District Council – local decision makers, intermediary between PT operator and inhabitants of chosen region.

**Results**

**Expected vs Actual Benefits**

The main goal - to enlarge PT reach and increase PT patronage in a chosen area by introduction of a new demand responsive transport service which is better customized to potential passengers’ needs, has been achieved. Details in table.

No.	Target	Rating
1	Enlargement of PT offer by implementing the first demand responsive transport service in Poland	**
2	Testing of demand-responsive lines in the areas suburban of Rybitwy, Podwierzbie and Biezanow in South - East Krakow, 2 small buses will be used to run the system	**
3	Launch of the management and control centre for the demand responsive system Introduction of a new phone number to make system available for all users	**
4	Institutionally integrate this efficient flexible PT service tailored to individual passengers needs	*
0 = Not Assessed    * = Substantially achieved (i.e. at least 50%)    ** = Achieved in full *** = Exceeded		

**Quantitative Results Achieved**

Since mid-July 2007, the Tele-Bus service has been developing and the number of transported passengers has been gradually increasing (starting with about 300 passengers in July and August 2007 and exceeding 2,000 in January 2008). The long term statistics will allow all the involved actors to evaluate the impact and the functionality of the flexible service with a view to future development of DRT in the city of Krakow. Further statistic show stable growth of passengers’ number:

(see: enclosed file – Tele-Bus maps.docx)

Cost increase in initial phase - during 2 years of DRT performance the Tele-Bus was an additional service provided in parallel with the regular PT (no reduction of regular bus lines due to lack of public acceptance). Consequently the total costs of PT were higher when comparing to the situation before the Tele-Bus introduction.

Cost savings after 2 years - since July 2009, after doubling the Tele-Bus network and successful limitation of regular bus lines the Public Transport Authority has started to observe cost savings.

**Qualitative Results Achieved**

The main objective of demand-responsive transport (DRT) in Krakow was to better serve passengers by giving them more personalised service that could be adjusted to their actual needs regarding journey time and destination, and without generating significant costs for the service launch and daily operation. According to

assumptions, the DRT service could replace conventional public transport in low density areas where regular service is inefficient.

The goals have been achieved, what is confirmed by further development of the area, covered by the DRT.

The service has its own regular clients, and students attending local schools are important group among them.

Rise of the number of transported passengers is very significant - the sum of passengers transported by conventional lines and the Tele-Bus vehicles have increased in comparison to the amount from the similar period before the service launch.

The last but not least result of Tele-Bus implementation is social acceptance for the new kind of PT service - continuous increase of users registered in the Tele-Bus system proves the interest in the flexible PT service.

## **Key Considerations**

### ***Lessons Learned***

The implementation of the DRT service must be preceded by a profound study of the specific character of flexible transport and existing examples in order to better use its benefits in a certain public transport system and reach a target which really needs and will appreciate such customised service.

It is recommended to insist on replacement or limitation of regular lines because in the situation when two PT services are being provided in parallel operating costs are too high in comparison to gained revenues.

### ***Primary Obstacles***

Significant problems that occurred during implementation of the Tele-Bus were related to organizational issues as well as social acceptance of this innovative solution. The first issue was to agree on a share of responsibilities for DRT service between two public transport actors: MPK (the operator) and Public Road and Transport Authority (PT&RA).

Changes in the Public Transport organisation and provision chain that took place in August 2006. The responsibilities of PT planning and operation were split between two entities: MPK (since August 2006 - only the PT operator) and Public Transport and Road Authority (established for PT planning and representing the City in the contract for PT services provision). The establishment of PT&RA and the preparation of a clear agreement regarding the responsibilities in the realisation of DRT services were time consuming therefore the implementation of the service was a bit delayed. The problem of the payment for service availability had to be solved as well.

Lack of social acceptance for partial limitation of regular PT with simultaneous introduction of flexible better customized transport service. The introduction of the Tele-Bus service was based on the assumption that two of the regular bus lines would be limited i.e. would only operate during the peak time. Unfortunately, inhabitants of the target area couldn't see additional value of the new flexible service - a possibility to be served exactly at the time they need without adjusting their trips to fixed schedules. They perceived the proposal only as an attempt to reduce the City costs and to take away PT service. Politicians decided to take into account the public complaints and keep conventional PT unchanged during the pilot phase. Such a decision, inconsistent with the assumption made in preparation stage, has its influence on chosen economy indicators, which in fact are difficult to be measured.

To make potential Tele-Bus users learn innovative character of the flexible PT service and respect rules regarding trip reservations.

### ***Critical Success Factors***

The key factors for the DRT service success are the following:

- definition of the objectives of the service implementation,
- a good choice of the service availability area,
- implementation of good DRT technology,
- clear regulations between involved public transport actors and
- a corporate image of the service that distinguishes it from regular public transport.

### ***Transferability Considerations***

Krakow Tele-Bus, the first flexible public transport service in Poland, is now in the pilot 4<sup>th</sup> year of the operation. The solution was transferred from Genoa and it has already been demonstrated as a transferable solution.

### ***Up-scaling Considerations***

The Tele-Bus has gone a few phases of development from its start in 2007. The experiences from functioning solutions are positive and further extensions of the Tele-Bus are under consideration.

### ***Contact***

Company: Miejskie Przedsiębiorstwo Komunikacyjne SA

Address: ul. Jana Broka 3, 30-347

Krakow, Poland

Mr. Adrian Obuchowicz

E-mail: [aobuchow@mpk.krakow.pl](mailto:aobuchow@mpk.krakow.pl)

Tel: +48 12 254 11 46