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Jan Perner Transport Faculty

**Customer Services and Ticket Distribution Systems in Public  
Passenger Transport**

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Preamble

1. Description of customer services in public transport
2. Regulations regarding prohibited activities
3. Comparison between Pardubice, the Czech Republic and South African regions public passenger transport systems
4. Proposal for improvement of inadequate public passenger transport system

Conclusion

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## **Nazev**

**Zákaznický servis a systém distribuce jízdenek ve veřejné hromadné osobní dopravě**

## **ANOTACE**

Bakalářská práce se zabývá poskytovanými službami a systémy distribuce jízdenek ve veřejné hromadné osobní dopravě. V práci je popsáno, jak je možné zlepšit nedostatečně fungující dopravní systém osobní dopravy. Pozornost je zaměřena na služby zákazníkům (jejich členění a popis) stejně tak na systém distribuce jízdenek. V práci je provedeno srovnání České Republiky – Pardubic a oblasti Jižní Afriky.

## **KLÍČOVÁ SLOVA**

Zákaznické služby, veřejná doprava, jízdné, cestující

## **ANNOTATION**

This thesis deals with the different types of customer services and ticket distributing systems that are found in public passenger transportation . It describes ways that can improve inadequate transport systems within the passenger transportation sector. Focus is made on customer services (description and types ) as well as ticket distribution systems, by comparing the town Pardubice, Czech Republic with other regions from Southern Africa.

## **KEYWORDS**

customer services, public transport, ticket systems, passengers

## **Poděkování**

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## Introduction

The public passenger transportation sector must have an excellent service rederation for it to function at an optimum level. The majority of users and non-users should benefit from the public transport operations. It must contribute to a high level of standard ( safety, efficiency, service provision ) in the economical, social and status of its‘ country, thus operate in accordance to the legislation of its‘ country.

Public passenger transport can be defined as the transportation of people together with their goods from one area to another within a public transport sector, by different transport modes.

Transport modes can be understood as that which allows one to get from one point to another , this includes trams, busses (trolley, mini and midi), trains, aeroplanes, bicycles, ships and personal cars. Any person or organisation that requires services within the public passenger transportation sector are known as its customers .In this work, the author looks at customer services and ticket distributing systems within the public passenger transportation sector<sup>1</sup>. (1)

Transport has objectives or main functions that allow it to work well in a prescribed area. The purposes of routes are to transport users to work, shopping, school, hospitals, recreational areas , sporting and other activites that may be of need. In every organisation such as the transport industry , there has to be problems or competition that hinders the smooth running of the industry. These may include time loss due to late transport modes, lack of informational tools for the customers, poor service delivery of operators, ineffcient transport personnel , poorly developed internet and mobile services , high tariffs and wrong operations of routes in an area. The work is focused on the question how to improve customer services and ticketing systems within the public passenger transportation.

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<sup>1</sup> Investopedia defines a transportation sector as anything relating to transportation of goods or customers.

# **1 Description of Customer Services in Public Transport**

Customer services in public transportation can be described as procedures or actions that enable a high standard of satisfaction among customers. The activities may assist the customer or user of public transportation in having a cost effective, time-saving and enhanced level of satisfaction during travel. Customers may be from all classes of life, ages, disabled and any person in need of its services as well as different organisations. The following points describe the basic services in public passenger transportation.

## **1.1 Timetables**

Timetables in public passenger transport are time schedules that give information on trains, buses, taxis and other transportational modes . Information may be on time, costs, travelling distances, types and classes ,connections of transportational modes , how they operate and by which companies they do . To ensure safety and regularity in transport the proper construction and usage of timetables is important.

Conditons for having timetables in a region :

- Transportation must be offered seasonally: daily, weekly and monthly etc.
- Transportation must run from the early hours to the late hours of the day.
- Services must operate with enough frequency ( hourly or half- hourly )

If in this case, the above mentioned points are followed we may have an increased-level of quality in transport and hassle-free, reduced travelling time. Timetables may be in the form of electronic ( e.g excel form ) , billboard, on display or printable form . (2) . Frequent customers who use these types' may include school children, travellers , workers or any person ( user or non-user) of public transportation .

The most common types of timetables are the integrated timetables. These types are usually very common in European countries (2)(3).

The European countries have well established theories on timetables , the most known are:

- a. Integrated timetables (I.T.T) ,
- b. Swiss model timetables,
- c. Fixed- interval schedules

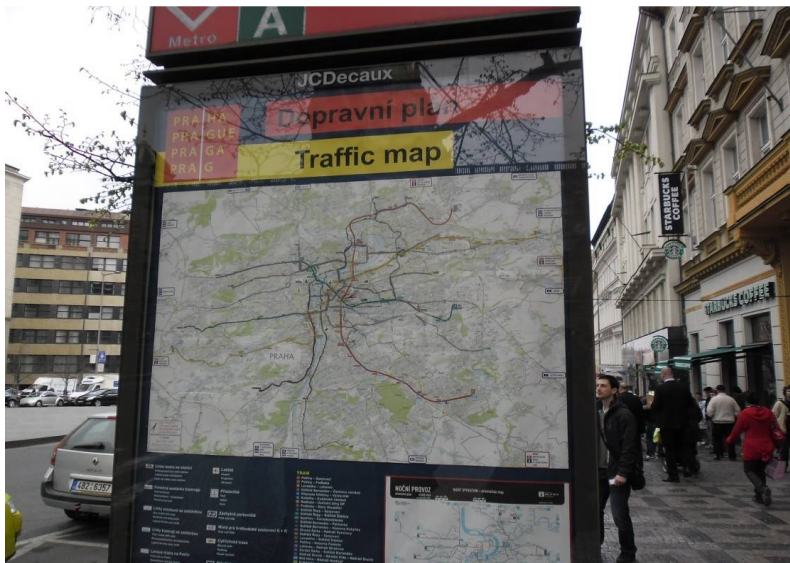
The idea of the Integrated timetables is to minimize the transfer time between buses, trains and other transport modes , thus operate on a fixed schedule I.T.T meaning *integrated timed timetable*, which are very common in the European countries such as Austria, Germany and Italy. The plan of the I.T.T is to operate at a fixed symmetrical time . The term integrated means the ability to connect or integrate to another transport line. These examples include Allgäu-Schwaben-Takt ( from Southern Germany ). (3)

## **1.2 Maps**

Maps are directional indicators that show places , stations and routes within the transport area. Maps also indicate the geographical area and names of buildings , cities , countries and relevant streets . They may show the aerial, topographical view of a place. They exist in colors, black and white, graphical, photos and color-coded lines, and are usually found in transportation vehicles, stations , platforms , websites ,travel cards and on timetables. Transport maps are designed and constructed in such a way as to meet the customers' level of informational expectation and needs. In airlines they assist customers in finding approximate travelling time and distances , as well as seating arrangements . Rail and bus maps help customers by showing them relevant travelling distances , destinations (distances and names) and sometimes the time required to get there. Maps in public transport are guiding tools for the customers. (4)

### **1.2.1 Traffic Maps**

On traffic maps there are different transport routes and connections that can be found . Customers may find the different stations and their names on those maps . Access of these maps maybe on the streets centers or next to public transport stops. A well constructed traffic map , may provide convenience for passengers as an excellent informational tool. *GIS* which is “*geographical informational system*” is one tool that can be used for mapping or finding ones place of destination. (4)

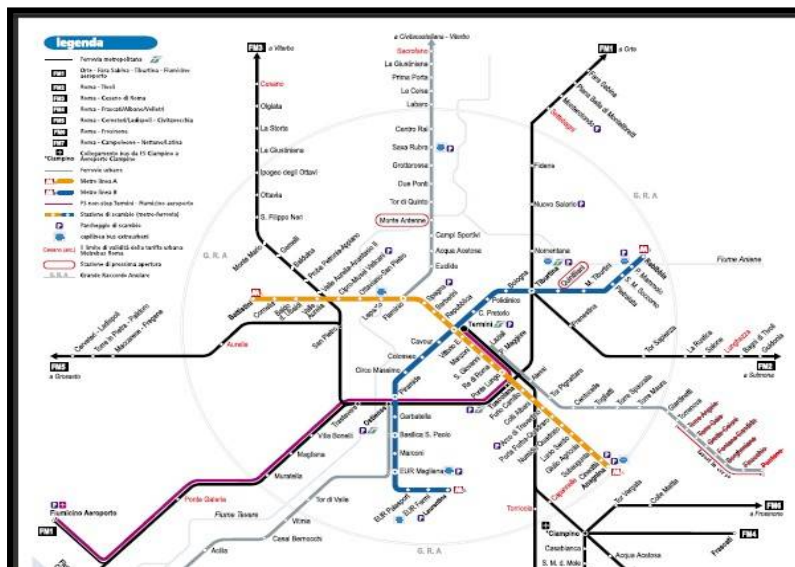


**Fig 1: Traffic Map in the City Centre of Prague**

**Source : Author(1)**

### 1.2.2 Line and Zone Maps

A Line map is a schematic diagram that is found in line transport. Line transport maps can show routes of buses, rail, trams and subway metro that are expressed in color – coded lines. Line maps are guidelines to the customers in which show where they can change routes, connections, stations by expressing them in fixed coded lines. Line maps are found inside rail cars, buses, trams and metros and appear in straight, simplified lines. (4)



**Fig 2 : Line Map of Italian Metro Maps**

**Source: Rimini Station**

### **1.2.3 Visual aids**

Visual aids are tools that maybe found inside public vechiles in public transportation . Their role is to assistant deaf people with the necessary information during the duration of travelling or any person who might find them useful ( tourists ) . When a deaf person , or customer of public transportation is travelling in a public transport vechile such as metro,or train, his only mode of communication maybe to look at these visual aids to assist him get to his place of destination . The visual aids maybe color contrast ,show the name of station or destination. They have to have a specific parametry such as dynamical speed of 6 characters/s,size of min 35 mm width and height of 70 mm .

### **1.3 Accessibility**

Accessibility transport in public transport caters for people with different disabilities and restricted movement. The restricted movement of these people may be those that cannot hear, move (wheel- chaired bound) blind and even foreign language.

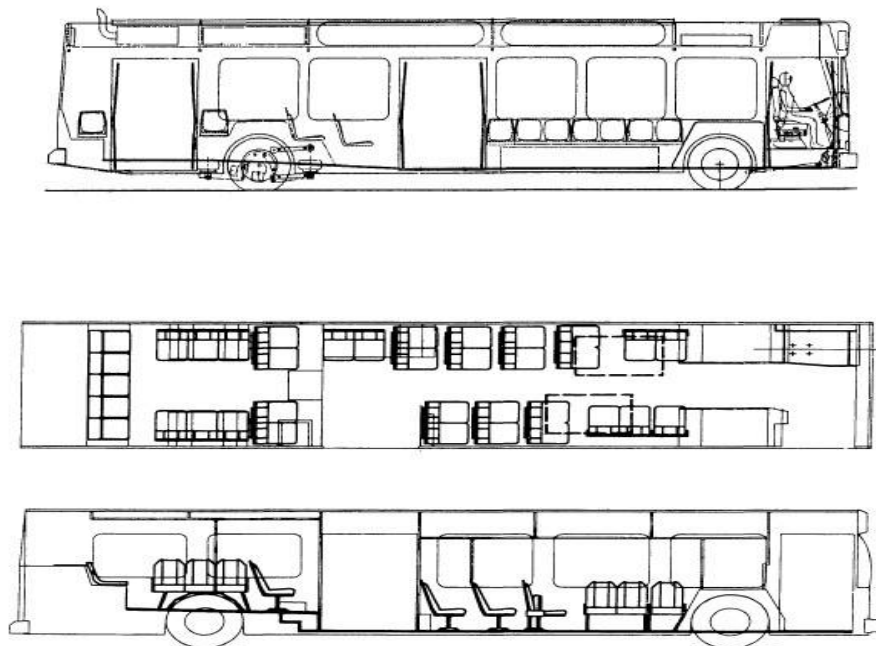
Public transport for people with disabilities should be in such a way as to accommodate their restricted disabilities. Apart from physical disabilities , accessibility transport may also include those with language barriers ( foreigners ) the aged , women with baby prams and people with luggages . Public transport has to accomodate such individuals or customers according to the different needs, requirements and legislation. The different groupings of disabilities can be classified according to these groups :

- Language handicapped (foreigners)
- Mobility-restricted disability (women with babies on prams, people with luggage)
- Physically handicapped disabilities (wheel-chaired ,deaf and blind.)
- Elderly people and young babies.

The following points the author looks at the different types of assistive technology in the public transport. These types of assistive technology can help improve the travel comfortability of disabled and people with restricted movement using public transport .

### 1.3.1 Low-Flat Floors [also ramp technology]

Public transportation equipment (cars, infrastructure etc ) has to be built in such a way as to cater for people with disabilities . The manner of which these are built must be of convenience to the customers and any person who might find them useful especially those with restricted movement . Low - flat floors (5) can be found in buses and trains, as well as entrances of buildings , use ramp technology to assist in the entrance of people with disabilities ( those on wheel – chairs, baby prams and sometimes the elderly ) . The advantage of the low-floors is to reduce the time- loss induced in stopping to pick up disabled passengers and those of special needs (elderly) . It also reduces the cost and usage of wheelchair lifts. (5)



**Fig 3: Internal View of Low- Flat Floors**

**Source: transit synthesis**

### **1.3.2 Audio and Ramps [Assistive Technology]**

This type of technology is used for people who have physical disabilities usually the blind and deaf. People with special needs cannot be classed with those without restrictions . In Europe and other countries in particularly, the blind customers are assisted by audio aids at pedestrian crossings that are connected to traffic lights. Audio aids are also found inside public transport cars ( such as trams, trains and buses ) and maybe in a form speaker announcer . (5)(7)

Blind people also depend on the different parameters that are found on the pavements such as warning lines, guiding lines found at pedestrian crossings and train stations. Good parameters found in well constructed pavements can provide people on wheelchairs with excellent accessibility.

Speaker announcers which are one form of assistive technology are usually found in airports , train stations inside buses or any other transport modes . They are an effective method used in providing information on travel time , distances and types of travel modes as well as other essential announcements.

Deaf people usually depend on color contrasts, signage and induction loops. Public phones, ticket auto machines should be marked with an international sign of deaf people pictogram . It is also advisable to train transport personnel on the efficiency of treating disabled people as normal customers of public transport.

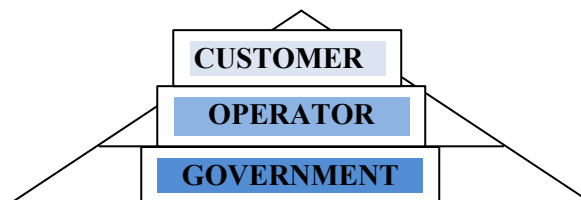
## 1.4 Ticket Distribution Systems and Tariff

A tariff system can be defined as the method used by a country to tax commodities that are involved in the economy of its' country. Tariff is also known as fare or pricing of a ticket. These may include the exporting and importing of goods. Tariff informational tools may consist of the following : (6)

- a) costs or pricing of tickets,
- b) tariff zones,
- c) chip cards, groupings of users etc.

Main purpose of ticketing systems is to generate income for the government , or privately owned operators . According to the Czech legislation on Law 111/1994 of road transport (12) Act no 19 defines tariff within road transport , as the pricing resulting from services rendered or used within public transportation. The pricing of one journey to another is known as a “fare“.

Correct pricing for a journey has to have balancing as shown in the following:



**Fig 4 Hierachy of Levels of Tariff Implementation**

**Source : Author(2)**

The above mentioned hierachy explains the different roles and expectation . The lowest part of the hierachy which is the government or authority has the following functions: the tariff system of the country functions is to : increase number of customers using public transport and , setting affordable ticket prices . The operator’s role is to: increase profit and customer usage , the customer wishes are to minimise spending costs and have a comfortable and efficient travel.



## Types of tickets found in public transportation P.T

- a) *Zones tickets*: single or multi-zones, group tickets, periodically tickets (daily, monthly or yearly)
- b) *Prepaid tickets*, contactless tickets, smart cards and electronic tickets.
- c) *Group or combined tickets*

Tickets can exist in different formats such as chip cards, paper tickets, tokens, prepaid and electronic . Customers from the passenger transportation can buy or get their tickets from : automated machines , on the internet (e.g airline ticketing ) , from counters in shops , transport buildings ( counters ) , transport personnel and on vehicles (marshals).

The following individuals are subject to discounts and this is known as concessionary fares: disabled individuals, seniors, infants, army or distinguished officials, students groups or frequent travellers. (6)

The general types of groups of tickets that are found and used in public transport include:

- Single ticket (one trip)
- Return ticket (two or more trips)
- Seasonal tickets (weekly / monthly/ short- term/ long term tickets)
- Combined tickets( ex.Park and Ride)
- Flexible tickets

Distributing methods may include

- Sms ticketing
- Chip cards
- Contactless cards
- Smartcards

- Magnetic chips
- Automatic machines

Sales points of tickets may include

- Transport booking offices
- From the driver
- From vendors
- Transport personnels
- On the internet
- Mobile ticketing ( SMS)
- Over the counter

Different costs involved in implementing a good ticket systems . (6)

1. Costs involved in developing a good ticket systems
2. Costs involved in the technological usage of tickets systems ( e.g software)
3. Security and maintenance
4. Costs involved in monitoring and updating ticket systems



**Fig 5 Distribution of Ticket Systems**

**Source : emta.com**

The Czech Republic is known for its well established theories on public passenger transportation tickets. In the Pardubice region of the Czech Republic, the first implementation of this projects was initiated in 1998. The ticket project was founded by the EU . The Pardubice region uses the distribution card known as Mifare (8) Standard. It has a 4kB memory and was made available in 2006.

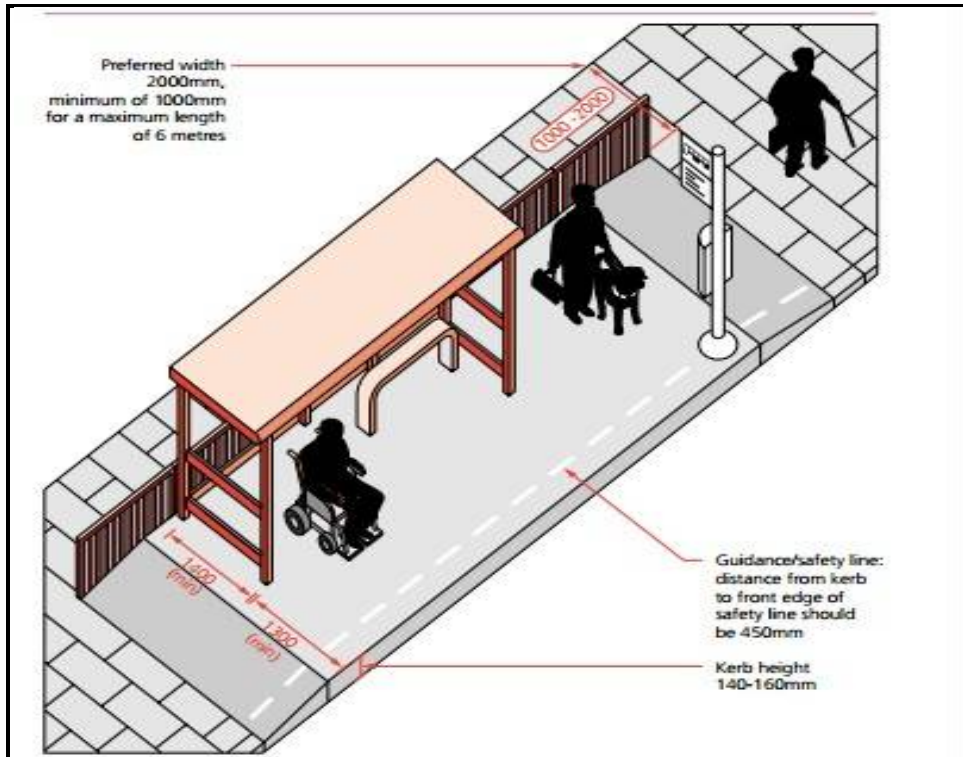
## 1.5 Infrastructure

Transport infrastructure can be defined as the summary of transport networks together with different building, road usage ,routes and equipment used in the public transport area. In the different subsystems of public transport we define buildings and necessary equipment to ensure the efficiency of running public transport. Subsystems of public transport which include ( trains, trams, buses, aeroplanes, taxies and subways) usually have the specific infrastructure for specific usage and needs. The customers are entitled to have the following at their disposal or nearby within a public transport area:

Automated /electronic machines or convenient shops to buy tickets

- Shelter at bus stops
- Information assistance either technological, by transport personnel or posted on buildings.
- Toilets in buildings such as train stations, airports etc
- Safety and Security for long- distance travellers.
- Properly trained transport personnel (air hostesses, drivers etc)
- Benches or seating for customers waiting for their transportation.
- Easy access for travellers.(disability accessibility)
- Labelling of transport modes according to respective journey
- Comfort and Convenience(proper seating,aircons or windows that properly work)
- Properly constructed pavements for pedestrians

The public areas of public transport should have places or areas of convenience for the customer usage. Pavements should be built or constructed according to the different legislative parameters that are able to cater or assist people with disabilities. Wheelchair bound individuals should be able to move with ease. Transport availability such as cars should be readily available.



**Fig 6 Infrastructure at Bus Stops**

**Source : inclusive mobility**

## 1.6 Taxi Services

In some European states the system of taxi services is used as a special integrated system in public transport. It is convenient for people with restricted mobility, elderly and tourists. The advantage of taxi services is that they often reach places where other transport modes don't go, the disadvantage of these is that they are often very expensive as they are calculated according to the distance travelled and might be operated by private sectors. The divisions of the services within taxi transportation may be shuttle services, mini and midi bus taxis, metered taxis, special needs taxis, tourists and chauffeur drivers. (9)



**Fig 7 Taxi Services; Metered and Shuttle Services**

**Source: Author(3)**

In South Africa, the taxi industry is often the preferred transport used by general commuters. It is convenient for the vast majority of inhabitants who are often middle and low class income earners . The irregular roads in rural areas allow the efficient usage of taxis. Taxis in South Africa are divided into mini and midi buses. They are usually privately owned by companies that provide for employment for a vast majority. The taxi industry in South Africa contributes to just over 60 % of the total of public transportation . It also has different organizations examples Santaco (South African National Taxi Council) ,Samta(South African Meter Taxi Association) etc, these ensure proper legislative procedures and labor ethics that protects the prescribed employees. It also creates primary jobs such as drivers, administrators, security guards and fare collectors .(9)



**Fig 8 South African Taxi Services**

**Source :deloitte.com**

## 1.7 Internet and mobile Devices

The development of technology in this century has allowed the usage of software that allows convenience for customers of public transport. On the website page of a typical transport operator, the presentation the following can be found :

- Transporter or carrier information
- Cost and ticketing information
- Information on a city or destination (weather, time etc)
- Schematic diagrams showing links
- Timetables and connection
- Historical interests of a destinations and photo (gallery )
- Maps (sitemaps )
- Contacts
- Reservation areas and comparing of costs
- Options to buy tickets
- Blind friendly usage and language options

The internet can also be used by the customer to plan his journey, navigate and find the next transport modes. Mobile devices often use WAP for information with the help of sms message. GPS is one popular system used to locate the position of an area.

Information technology is one method that can be used to provide general information. In Europe, the Czech Republic the most common types are the *DORIS* system in the city of Prague and *RIS* system in the city of Brno.

System *DORIS* is the system used to control and give information on trams . It's main functions is to track and locate all trams in a prescribed area. Manage radio operators with the trams, manage outbound and inbound of trams .

*RIS* (řídící a informační system) which means management and information system. It's main objective is for communicational purposes and central dispatching services. Apart from the quality communication it provides, it also provides information of different transport modes for travellers and drivers in advance.(9)

## **1.8 Safety and Security**

As the public passenger transport sector is used by a lot of people it is prevalent to have security measures for both users and non-users of public passenger transport sectors.

Risks that are clearly defined may be criminals who target customers during peak hours , pick pocketers etc . Customers need to be vigilant at all times when travelling or using public passenger transports.

Safety and security in the public passenger transport sector is of high importance . Transport buildings such as airports, train stations, subways etc,security has to be of the highest importance because mass people use these facilities .

Security officers who are available in this building often make random or rotational observation to check for any risks in that area. Surveillance cameras can also act as an important tool to scan risks.

As in the cases of terrorism, whereby trains ,airplanes and subways are targeted, it's the governments responsibility to ensure maximum possible security for the inhabitants and users of its country. Transport officials can organize plans or systems to help in evacuation plans as in the cases of emergencies.

Crime is one other negative factor in the public passenger transportations. People who use public transport can be targeted by criminals. Those targeted may usually be at risk as those travelling in the early hours or late hours. Criminals often target women, the disabled and elderly. These group of people may be robbed of their valuable belongings, money and loss of luggage during travel. Risk zones leading to loss of lives may be at pedestrian crossings, where kids cross without supervision. Lack of proper paving for people on wheelchairs can also be high risk zone for them. Public passenger transport customers need to be vigilant and alert at all times.



## 1.9 Customer Complaints

Every user and non-user of public transport could experience problems within the public transport sector. Transport personnel or operators must be qualified or have strategic plans in order to solve the common problems that customers may experience. Apart from complaints beyond the control of the operator, he may develop plans that may help compensate certain customer problems or complaints. An example of a common strategic plan is in the aviation transportation; when a passenger or customer has lost valuable time due to the operator's fault as in the case of flight delays, the company usually has a compensation actions plan that helps to alleviate the customers frustration or complaint.

The most general complaints in public passenger transportation that may arise include:

- Overcrowding
- Delays
- High tariff prices
- Loss of luggage
- Lack of informational tools
- Safety and security
- Drivers who are incompetent and don't follow transport rules.
- Uncomfortable travel
- Lack of infrastructure
- Long hours and queues waiting for transport
- Ticket refund complaints

Different types of transport operators have taken the initiative to help solve these problems. Organisations have developed strategies that are readily available on their websites and these companies usually engage with the media constantly. The awareness is made through the media, educational advertisement program, public involments as well as marketing of their services.

## **2 Regulations regarding prohibited activities in public transportation.**

The transportation industry has developed different legislation that include regulations on rights of customers and the transport operators . One regulation from Czech Republic is known as the “conditional carriage” from the Law 175/2000, which applies for both road and railway passenger transportation. The Act in Czech language is known as the *přepravní podmínky*. The law consists of the rights and obligations of the passengers as well as the carriers. The law applies in public transport. Some of the following points from the Decree No. 175/2000 are as following (10)

1. Introduction
2. Agreements of transportation of people
3. Tickets or travelling documents
4. Payment of luggage
5. Transportation of prams, bicycle and tricycle
6. Transportation of people with restricted movement and orientation
7. Relationship between operator and passenger
8. Conditions for transporting luggage
9. Transportation control
10. General (other)

Apart from the conditional carriage law of the Czech Republic. There are well defined regulations of different transport operators such as the Railway transportation law which has to do with the different types of obligations and rights of those travelling in the railway passenger systems this Act is from the 266/1994 *Zákon o dráhách* (railway law) . Excluding the railway passenger transportation act, there is the well defined law 111/1994 *Zákon o silniční dopravě* on the road transportation which is both divided into passenger and freight transport and many disciplines within the Czech Republic. These regulations apply to both the national and regional department of passenger transportation. (11) (12) (13) Some of the common prohibited activities in public passenger transportation include:

### **2.1 Food, Drinks and Smoking**

Employees and drivers are prohibited to smoke in the presence of public passengers and any person in use of public transport facilities and those places that are marked with a prohibited sign of “no smoking”. The concept of *no smoking* allows people with breathing problems or

allergies as a result of smoking to also be accommodated in public transport vehicles and buildings. One method that can be used by transport authority to control the level of smoking in public transportation is to put no- smoking prohibited signs,use lawful principles and also have smoking zones or area at the surrounding areas. (14)

### 2.2 Bathing and Laundry in Public Transport

It is prohibited to do laundry in public transportation facilities that may hinder other users of transport. Bathing is only allowed in specific lavatory areas that have specific facilities or areas that cater for such (airport showers, train stations etc ) .

### 2.3 Prohibited Items

In the passenger aviation transportation, for instance a lot of items have been restricted. Items such as sharp objects, explosives, guns ,chemicals, firearms and anything that might endanger the lives of those using airplanes. The regulation belongs to the Warsaw Convention, which was signed in 12<sup>th</sup> October 1929 to regulate liability of items, buggage and goods of the customers. This is an international convention and it's from Poland. It's in the french language. The table below shows the different types of prohibited items to carry on-board on airplanes. The legislations are different from every country. (15)

items not permitted – no exceptions		
<b>Aerosols –</b> Not intended for use or consumption on the human body as toiletries or food	<b>Flare Guns</b>	<b>Pesticides</b>
<b>Air Freshener</b>	<b>Fuels –</b> Including cooking fuels and any flammable liquid fuel	<b>Plastic Explosives</b>
<b>Ammonia</b>	<b>Gas–Powered Equipment/Tools</b>	<b>Portable Automotive Starting Devices –</b> Using an uninterruptible power supply
<b>Black Powder</b>	<b>Gasoline</b>	<b>Pyrodex</b>
<b>Blasting Caps</b>	<b>Gas Torches</b>	<b>Radioactive–</b>
<b>Bleach</b>	<b>Hand Grenades</b>	<b>Pharmaceuticals</b>
<b>Butane / Propane Gas Refills</b>	<b>Hydrogen Peroxide Solution –</b> Containing more than 7% per volume of hydrogen peroxide	<b>Realistic Replicas of Explosives</b>
<b>Camp Stove Fuel –</b> Propane, white–gas, butane, gasoline	<b>Lighters –</b> Liquefied gas (butane), using fluid contained in absorbent (Zippo type), electric/battery powered, novelty	<b>Realistic Replicas of Incendiaries</b>
<b>Carburetor Cleaner</b>	<b>Lighter Fluids</b>	<b>Spillable Batteries –</b> Except those in wheelchairs
<b>Chlorine –</b> For pools and spas CO2 Cartridges, Cylinders & Tanks	<b>Liquid Bleach</b>	<b>Spray Paint</b>
<b>Disinfectant</b>	<b>Liquid Oxygen</b>	<b>Strike–anywhere</b>
<b>Dynamite</b>	<b>Magnesium Flares</b>	<b>Matches</b>
<b>Fire Extinguishers</b>	<b>Mini Torches</b>	<b>Tear Gas</b>
<b>Fireworks</b>	<b>Octane/Fuel Additives</b>	<b>Turpentine and Paint</b>
<b>Flameless Ration Heaters</b>	<b>Oven Cleaner</b>	<b>Thinner</b>
<b>Flammable Glues/Epoxies</b>	<b>Paint</b>	<b>Varnishes</b>
<b>Flares –</b> in any form		

Fig 9 :Airways- Permitted and Prohibited Items

Source : Airtran

## 2.4 Luggage

The EU rail system, UIC makes provision for different types of travelling equipments such as bicycles on board , together with customers or passengers, this however may be labeled or informed to the traveler on the specific carriage . Certain carriages example trains or coaches do make room for luggage on board, such places for cars, trailers, holding wires and assistive equipments (such as wheelchairs). Operators will usually notify the traveler or passenger on the minimum weight or acceptable parameters of luggage. The South African airlink regulation on baggage is divided according to (weight concept) WC and piece concept (PC) .Weight concept has to do with the worldwide or international kilograms of luggage that a customer is entitled to carry according to the type of ticket . Piece concept (PC) has to do with the origin of the pricing or fare of the kilograms of the specific baggage. RFID is an acronym for **R**adio **F**requency **I**dentification. This type of technology is used to identify different types of baggage. It works by placing a silicon chip in an identified tag, which can be used to track the baggage as it travels from one place to another. PPBM stands for Positive Passenger Bag - Matching, this type of technology is often used by the aviation security to match a checked in bag together with its own. Baggages that do not have owners who have checked are prohibited from travelling. (15) (16)

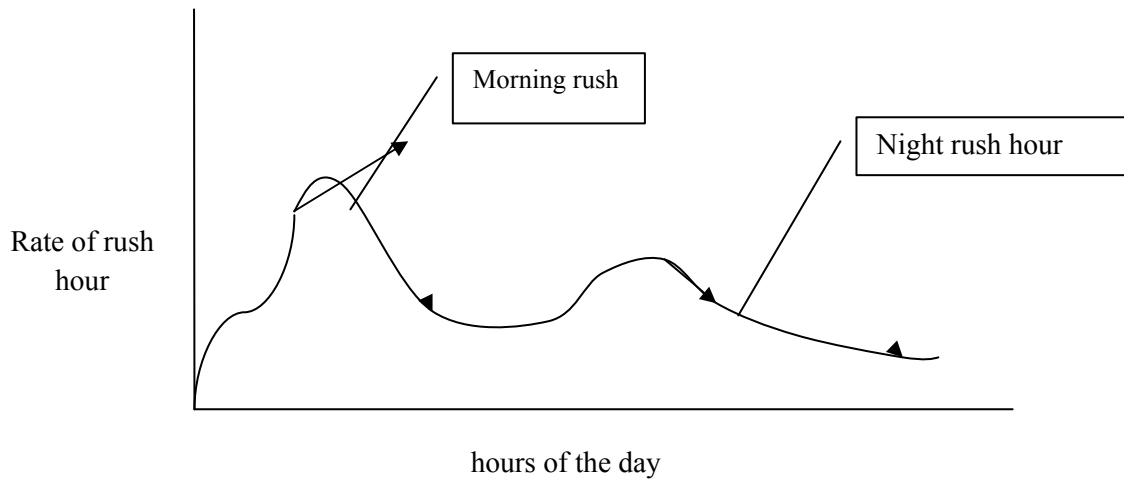


**Fig 10: Luggage**

**Source : [tripneeds.com](http://tripneeds.com)**

## 2.5 Peak Hours

Time is an essential commodity in public passenger transportation, the customer often seeks transport that is readily available to get to his place of destination. Peak hours are often during the morning rush hour, afternoon and evening. Rush hours or peak hours are hours where demand of transport is at its highest and the results are often road congestions. The graph below shows the different peak hours during the day. It's usually the highest in the morning during the weekdays as passengers go to work, school and other destinations and later in the afternoon.



**Fig 11: Graphical Representation of Peak Hours in a day**

**Source : Author(4)**



### **3.1 Public Transport System in Pardubice Town has the following characteristics**

- Well developed
- Reliable and effecient(punctual)
- Properly constructed timetables
- Integrated transport system(bike & ride,park & ride etc)
- Accomodates disabled people(specialised trains,buses and assistive technology)
- Has proper organisation according to the legislation
- Lesser congestion and road accidents
- Availabilty of transport(accomodates capacity of users)
- Good infrastrucure( bus stops, properly constructed roads,shelter and comfortable seating)
- Usage of latest information technology (booking of tickets on websites,checking availability of local transport on the local transport website)

**Tab 1 : Comparison of Public Transport Modes (year 2005 - 2010)**

<i>Total passenger transport performance (mill. passenger-km )</i>	<b>108 602,8</b>	<b>110 611,7</b>	<b>112 799,4</b>	<b>115 045,3</b>	<b>115 183,2</b>	<b>107 508,6</b>
<b>Rail transport</b>	6 667,0	6 922,0	6 898,0	6 803,3	6 503,2	6 590,7
<b>Bus transport</b>	8 607,3	9 501,2	9 518,8	9 215,2	9 493,6	10 815,6
<b>Air transport</b>	9 735,7	10 233,1	10 477,3	10 749,0	11 330,9	10 902,0
<b>Inland waterway transport<sup>1)</sup></b>	18,1	12,8	12,8	17,3	10,5	12,8
<b>Urban public transport</b>	14 934,8	14 312,7	14 352,5	15 880,5	15 555,1	15 617,4
<b>Total public transport</b>	39 962,8	40 981,7	41 259,4	42 665,3	42 893,2	43 938,6
<b>Passenger car transport<sup>2)3)</sup></b>	68 640,0	69 630,0	71 540,0	72 380,0	72 290,0	63 570,0

**Source: Minister transport yearly book Czech Republic from (2005-2010 )**

**Tab 2 : Comparison of Public Transport Modes Performances**

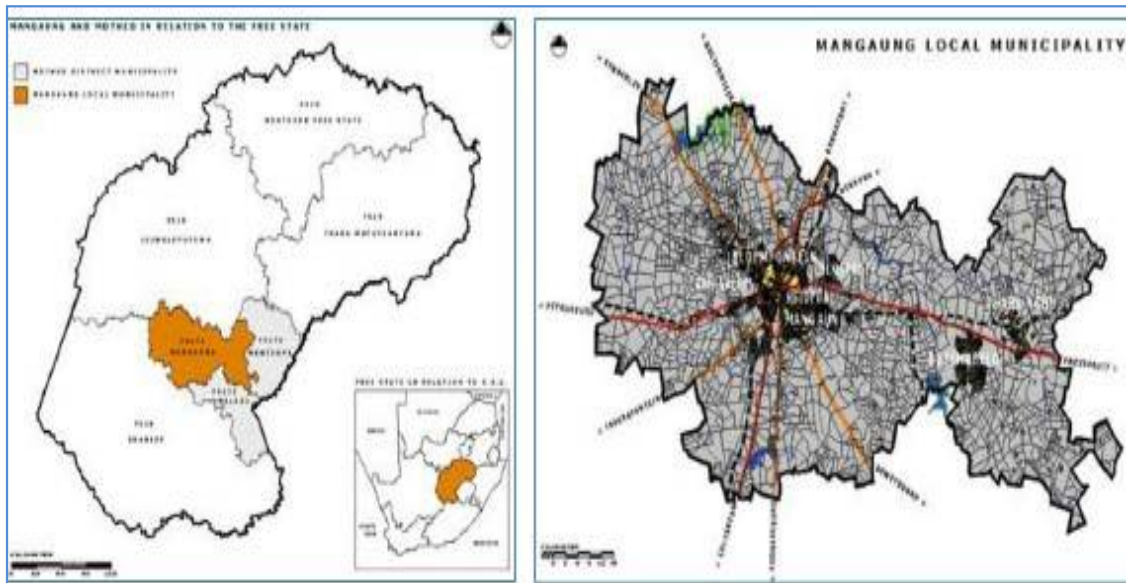
	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<i>Total passenger transport (mill.)</i>	<b>4 974,9</b>	<b>4 976,6</b>	<b>5 045,7</b>	<b>5 132,6</b>	<b>5 043,1</b>	<b>4 784,6</b>
<b>Rail transport</b>	180,3	183,0	184,2	177,4	165,0	164,8
<b>Bus transport</b>	388,3	387,7	375,0	373,4	367,6	381,2
<b>Air transport</b>	6,3	6,7	7,0	7,2	7,4	7,5
<b>Inland waterway transport<sup>1)</sup></b>	1,1	1,1	1,1	0,9	1,2	0,9
<b>Urban public transport</b>	2 268,9	2 238,0	2 258,4	2 323,8	2 262,0	2 260,3
<b>Total public transport</b>	2 844,9	2 816,6	2 825,7	2 882,6	2 803,1	2 814,6
<b>Passenger car transport<sup>2)3)</sup></b>	2 130,0	2 160,0	2 220,0	2 250,0	2 240,0	1 970,0

**Source: Minister transport yearly book Czech Republic from (2005-2010 )**



### **3.2 Public Passenger Transportation of Mangaung, South Africa**

The vast majority of South African population uses mini-buses as a convenient mode of transportation . The mini- buses are usually found at taxi ranks or at loading and off loading stops. Except trains mini buses which are usually called “taxis” ,are the preferred mode of transport as they reach places where other public transportation don’t go ,convenient and easily accessible. The taxi industry in South Africa contributes to just over 60 % of the total of public transportation.It also has different organizations examples Santaco(South African National Taxi Council),Samta(South African Meter Taxi Association) etc,these ensure proper legislative procedures and labor ethics that protects the employees and employers rights and obligations. It also creates primary employment jobs such as drivers,administrators,security guards and fare collectors (9) . Trains are also preferred by large amount of people to use them to get to and from work and other places of conveniences . South African local trains are usually overcrowded to full capacity due to the high demand during peak hours. The problems that are encountered in the passenger rail of South Africa are the following: common delays, derailment resulting into accidents, malfunction due to old or worn out usage of technology and vehicles, incompetence in personnel (lacking knowledge of usage of technology e.g signaling of trains and communication ).



**Fig 13 Representation of Rail and Road Zones in the town of Mangaung** Source: [mlm.co.za](http://mlm.co.za)

Mangaung is a metropolitan city that is situated at the central region of South Africa, at the region called Free State. Mangaung consists of sub-towns such as Batho-pele, Thaba Nchu, Botsabelo. The local inhabitants of Mangaung public transportation usage is divided into Bus and taxi commuters, trains users as well a small amount of non-motorised vehicle usage such as bicycles etc. The local bus system is governed by the Interstate bus group as well as other privately owned bus companies. The train system is operated by Shosholoza Meyl. Road routes that operate around the area include the N1 connecting the Western Cape region and N8 linking the Northern Cape region together with the Lesotho country. The population of Mangaung is just over 600 000 inhabitants. Due to the developing of this city it is slowly improving its public transportation usage. Development on the improvement of infrastructure such as roads and upgrading of other public transport facilities is undergoing.

As this a developing country, its customer services or passenger informational tools still need improvement. The most noticeable problems and changes in the public transportation include the following. Problems discussed below may arise from the different types of public transportation modes such as trains, buses and taxis. Taking into consideration that taxis form one of the preferred choices in public transportation systems.(9)

The Mangaung public transportation common problems include :

- Overcrowding
- Standing in long-queues waiting for transport(during peak hours)
- Ticket fares too high(unstable)
- Frequent late transport(supply doesn't meet capacity demand)
- Poorly constructed timetables(or not available at all,rural areas)
- No informational tools for travelers(audio speakers, maps or technological device) rural towns.
- Lack of usage of the latest technology(passenger trains)
- Lack of accessible equipment for the disabled(limited or not-available) e.g ramp technology
- False usage of parameters (routes)
- Poorly or wrongly constructed transport routes
- Inadequate infrastructure
- Incompetent transport personnel (train drivers, customer service )

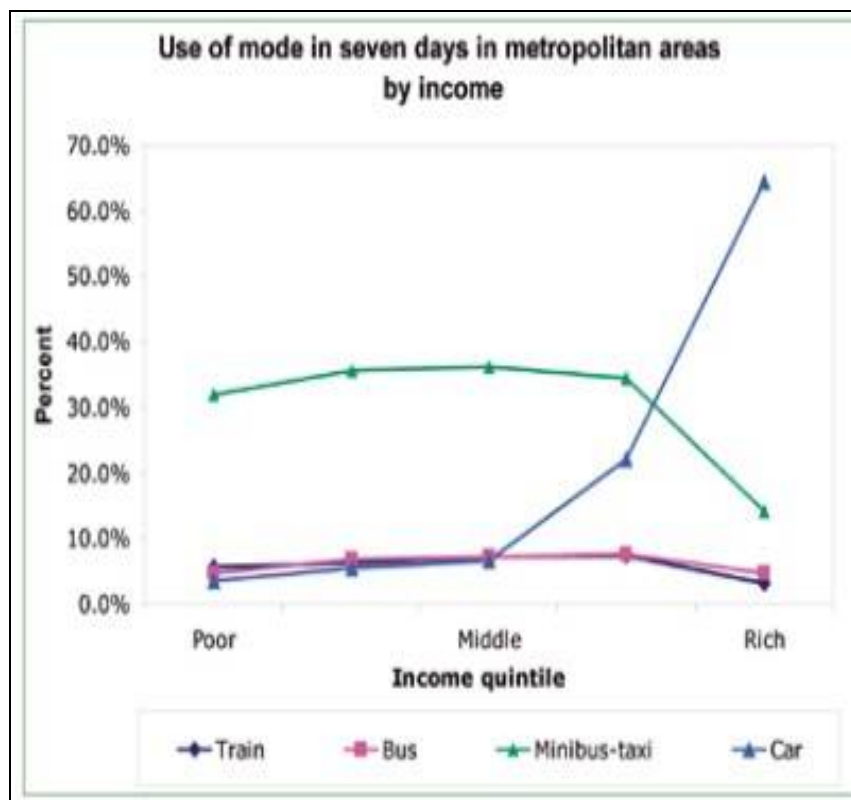


Fig 14 South African Usage of Public Transport Modes

Source: durban.gov.za

## **4 Proposal for Improvement of Inadequate Public Passenger Transport Systems.**

### **4.1 What makes a good Public Passenger Transport System (P.P.T.S)**

A high-quality transport system, that functions at an optimum level, has to have the following points in order; proper managerial or governance structure and good transport planning. A quality transport planning leads to good service rendering in an area. The public passenger transportation sector has different types of customers, that require basic services within this sector. A good transport system must have the prescribed basic services that are described in Chapter 1 to have an optimum level function. For a public passenger transportation system to be attractive to its targeted customers it must have services that are affordable, attractive, readily available and accessible.

The most ordinary problems of public passenger transport systems include time loss, lack of informational tools, poor service delivery of operators, technical errors in cars that lead to delays, uncomfortable travel as well as congestions. Lack of accessibility for the disabled, also leads to unsatisfactory travel within the disabled customers.

#### **4.1.1 Government Structure**

A good management structure or transportation department should implement good strategies that enable high-quality service delivery among its citizens or customers. In the Czech Republic the urban and suburban areas are governed by these types of regional transportation departments. These regional transport systems play an important role in controlling and identifying inadequacy in transport services and are readily available in supplying the areas with good transport services; an example of these is from the Czech Republic; Hradec Kralové region the *VYDIS* (19) (*Východočeský dopravní integrovaný systém*) system which means “East Bohemia Integrated Transport Systems” from the towns that are situated in the east. The *VYDIS* system includes the legislation on Hradec Kralove and Pardubice towns’: passenger railways, urban and suburban bus systems, trolleybuses and tariff area which consists of 21 zones. (19)

#### 4.1.2 Provision of Informational Tool

Every public passenger transportation sector has to provide its customers with the necessary informational journey tools. These aids help the user of the services within the public passenger transportation with information that helps him to have a hassle free travel .The informational aids maybe: Maps,timetables, ticket machines, transport websites and electronic informational tools that help the customer to find necessary information and assist him.The picture below shows a blind person,using technological usage to help him find necessary connection.



**Fig 15 Usage of Technology to assist Disabled People  
TRD faculty**

**Source: Ing.J.Matuška, Ph.d TRD**

### 4.1.3 Travel Time

Congestion, delays and time loss usually results to time. Time is a very important commodity within the public passenger transportation sector. The success rate of the public passenger transportation within the European countries is affected very much by time. The fact that timetables are constructed in such a way to minimise the waiting time of the customers, which is seen in the well constructed railway timetables. Travel time is an important factor to the customer as this will help reduce frustration involved in time loss, delays and inconvenience. Time loss due to unforeseen circumstances can also lead to the transport operators loss of revenue and thus ultimately affect the country's economical performance. One way to reduce the level of time loss induced in congestion can be the introduction of special lanes or routes for buses (sub and urban).

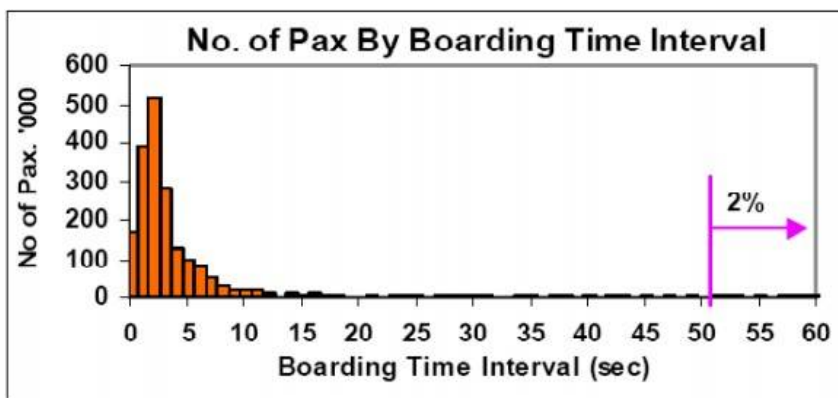


Fig 16 The Average Time to Board on Public Transport vehicle

Source: durban.gov.za

### 4.1.4 Ticketing and Fare Systems

A well-constructed fare system that is affordable and cost effective can attract more customer usage in public transportation . If the prices are too high, the introduction of pre-paid tickets or electronically ordered, smart cards can be used. Group discounts or frequent travellers packages can also help the transport operator attract more customers or users in this sector. A transport operator or transport authority must remember that a good constructed ticket pricing brings to more customers.(6)

#### 4.1.5 Technology Usage

Many transport operators have introduced technological systems that help keep up with the noticeable demands within the sector. Certain countries have well established theories on these systems, and are inclusive of the intelligent transport systems. Typical examples include self-service Kiosk that are found within terminals such as airports, train stations etc. The transport self- service kiosks can be a touch screen that helps the customer track down transport informations as well as pick pre -ordered online tickets. One other common technology is the proper construction of transport websites.

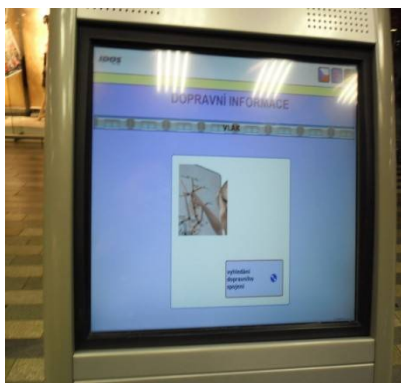


Fig 17 : Self - Service Kiosk

Source :Author(5)

#### 4.1.6 Summary of noticeable solution

The summary below gives noticeable approach how to solve inadequate customer public passenger transport services. The solutions can be implemented when introducing new transport systems in an area and also in developing countries that wish to improve the level of quality in their transport services. A well established and quality transport system has to have the following points in order: good transport infrastructure, transport vehicles (maintained in good operational conditions ) ; information technology (used in dispatching, customers, and employees), as well as good ticketing and fare systems. The table below gives a brief summary how to solve the basic problems that can be identified within the sector of customer services in public passenger transportation. Identification of these problems has been done in comparison to the already well established transport systems together with the worse transport services.

#### 4.1.7 Identified Customer problems and possible Solutions

Customer Problems	POSSIBLE SOLUTION
Overcrowding	<ul style="list-style-type: none"> <li>• Introduce integrated transport systems</li> <li>• Implementation and usage of timetables</li> <li>• Provision of more vehicles to meet demands</li> <li>• Quick frequency and dispatching of transport modes</li> <li>• Promote active participation in car pooling</li> <li>• Introduce bicycle systems as an alternative transport mode</li> <li>• Government upgrade infrastructure and security e.g pavements: to improve walking for shorter distances as an alternative.</li> </ul>
Waiting for transport {long queues}	<ul style="list-style-type: none"> <li>• Customer informative tools</li> <li>• Identifying zones that require more supply and meeting those demands</li> <li>• Supply should be readily available</li> <li>• Infrastructure for bus transit lanes</li> <li>• Usage of latest information technology(mobile sms) to get information on desired transportation</li> <li>• Quick dispatching, more vehicles</li> </ul>
Lack of informational tools	<ul style="list-style-type: none"> <li>• Introduce usage of informational technology (websites , mobile technology etc.)</li> <li>• Communication software between driver and dispatcher</li> <li>• Maps and visual aids</li> <li>• Customer relations: notification of customers to avoid frustration and inconvenience</li> </ul>
Delays	<ul style="list-style-type: none"> <li>• Transport integration (alternative – multiple options)</li> <li>• Information systems: communication</li> </ul>
Uncomfortable travel	<ul style="list-style-type: none"> <li>• Improvement of infrastructure</li> <li>• Proper seating arrangements (prams, wheelchair areas and spaces)</li> <li>• Maintenance and recovery of current vehicles</li> <li>• Introduce technological usage</li> <li>• Informational tools e.g vehicles specifically designed for the disabled</li> </ul>
Lack of customer relations	<ul style="list-style-type: none"> <li>• Employees with necessary customer relation skills</li> <li>• Media involvment and marketing of service provision</li> <li>• Community involvement</li> <li>• Advertisement of operators services</li> </ul>
Irregular fare prices	<ul style="list-style-type: none"> <li>• Transport operators introduce proper tarif systems according to the research made</li> <li>• Usage of contactless cards,smart cards and pre-paid cards</li> </ul>



- Funding for automated machines
- Introduce special school and workers packages(frequent travelers)
- Introduce affordable pricing of tickets with a travel zone(metropolitan, middle class and lower income zones)

## **Conclusion**

This bachelors work examines the types of customer services and ticket distribution systems that are found in the public passenger transportation. The first part of the work describes the different types of customer services that are used in the public passenger transport systems. It defines what a customer is and what his expectations are from the public passenger transportation system. The different types of customer services are described giving the applicable types of examples that are commonly used by the customers . The first part of the work describes commonly known and used types of customer services within public passenger transportation .

The effective operation of transportation of customers from one area to another has to involve regulations or rules that govern proper running of the transport services .In part two of this work the author briefly described different types of regulations regarding prohibited activities within public transportation .The third part of this work has taken two towns as a model study to compare the different types of customer services within public passenger transportation. Pardubice from the Czech Republic has shown a well developed side of customer services and ticket distribution systems within public passenger transportation. The well established train station that is accessible and caters for the different customers is suitable choice in explaining the adequate types of customer services. The train station is the focal point for the integrated transport systems (I.T.S). Close to the train station there are trolleybuses, city buses and metered taxis. The town of Pardubice as a choice of explaining the different types customer services and ticket distributing systems is shown in the well successful adequacy of service provision.In comparison to the Pardubice town's good public passenger transportation, one town from South African called Manguang was chosen as an example of the inadequacy of customer services . Manguang is a town situated in the Free State region of South Africa. It also has a train system that stops at stations such as Kimberly , Port Elizabeth and Cape Town. The inadequacy or worse customers services in the public passenger transportation of Manguang is shown in the waiting time for transport, and sometimes overcrowding and also customer complaints. Majority of the customers , complain about having to stand in long queues waiting for transport which is lack of I.T.S. Irregular taxi routes as they often travel in wrong constructed routes. Delays of transport as a result of irregular timetables and insufficient supply of transport that does not demand. Infrastructure is also one contributing factor in the Manguang region, as seen in the lack of well constructed roads and routes in the Batho

township as well as the deteriorating bus stops(shelter). The work in part three compares the customer services that are found in the Pardubice town and Manguang township.

The results found in the Pardubice Czech Republic and Manguang South African township gives a possible explanation on how to propose new ways that can improve inadequate customer services within public passenger transportation. The purpose of the work is to describe different types of customer services and ticket distribution systems as well as proposing new ways of improving worse or inadequate customer services within public passenger customer and this purpose was fulfilled .

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## Acronyms

DORIS	Traffic control and Information systems(Czech Republic)
E.U	European Union
GIS	Geographical Information Systems
I.T.S	Integrated Transport System
I.T.T	Integrated Timetables
P.C	Piece Concept
P.P.T.S	Public Passenger transport systems
P.T	Public Transport
PPBM	Positive Passenger Bag -Matching
RFID	Radio Frequency Identification
RIS	Information and Management systems
SAMTA	South African Meter tTaxi Association
SANTACO	South African National Taxi Council
UIC	International Railway Association
VYDIS	East Bohemia Integrated Transport Systems
W.C	Weight Concept

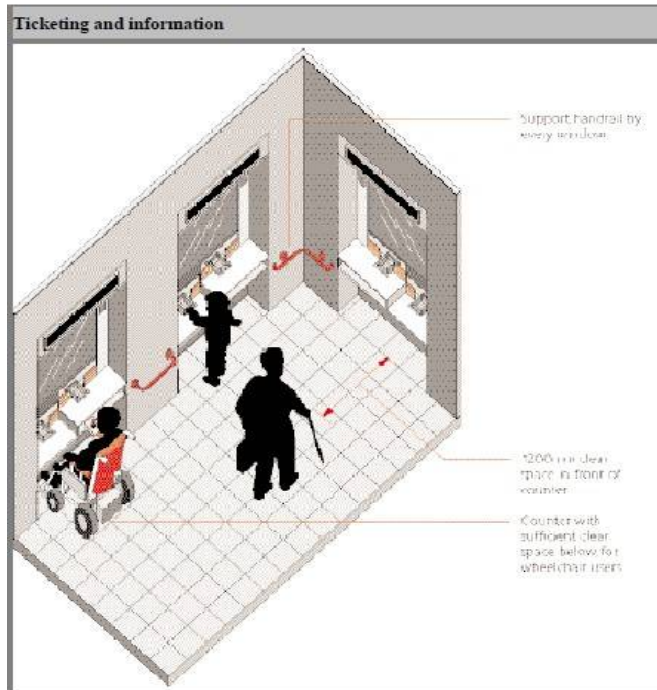


## **List of Appendices**

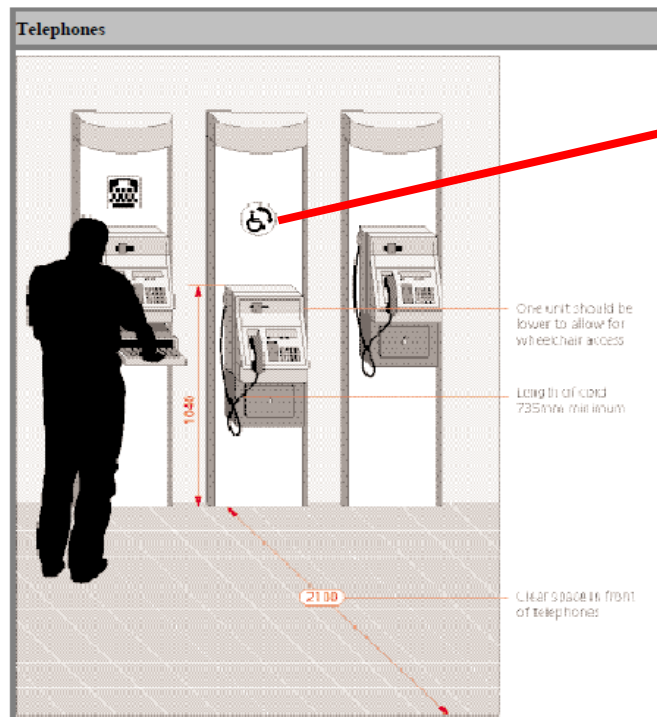
- Appendix A      Example of Customer Services in Public Transportation
- Appendix B      Services for Disabled Customers and Passengers in Public Transportation
- Appendix C      Summary of Ticket Distributing Systems
- Appendix D      Customers Services flow within Public Transportation

## **APPENDICES**

## Examples of Customer Services in Public Transportation



**Ticketing and Informational areas for Customers**

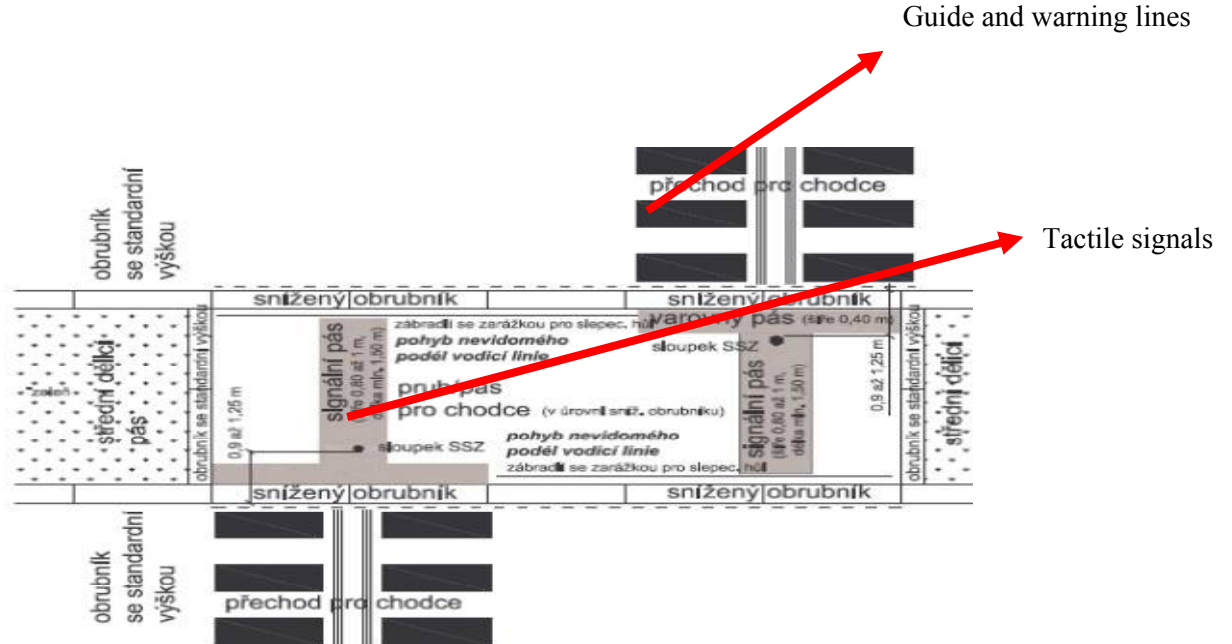


**Telephones**

## Services for Disabled Customers and Passengers in Public Transportation

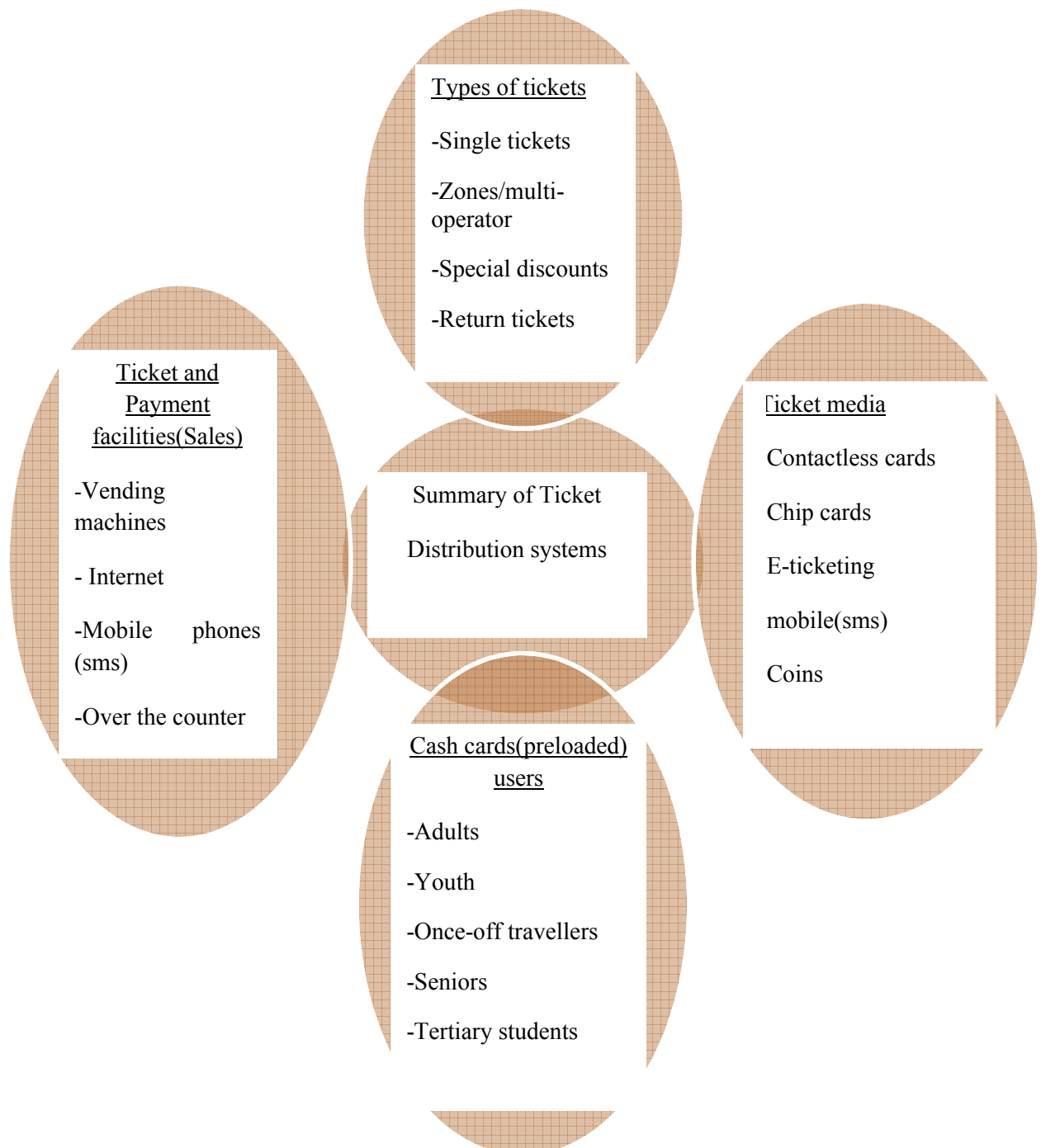


Acoustic Assistive  
Technology



Source: Ing. Jaroslav Matuška, Ph.D  
TŘD faculty (study material) barrierless transport

## Summary of Ticket Distributing Systems



### Customer Services flow within Public Transportation

