Module A: Systems and Operations of FTS

Content of the module

- Definition of Flexibility
- Flexible systems and operations in passenger transport
- Operations in Flexible Public Transport
- Primary tasks to evaluate and develop when establishing a new FTS
- Solving the institutional and organisational questions
What is flexibility on the next pages?

- The flexibility on the next pages is the flexibility of all public transport elements, which reduces at least some passenger’s travel time, mileage and trouble, and improves travel quality, compared to rigid timetable and linebased service offered by regular public transport in normal conditions, or in the time of incidents.

- In flexibility the PT takes into account for the individual personal needs of a passenger, and therefore most flexibility is unique by nature in operations.

- No indirect aspect are included here, as optimisation of person work, or optimisation of vehicles.
Which elements are flexible in Public Transport (PT)?

• In all traffic systems some element must be flexible.
• In regular PT services the passenger is the flexible element.
• There are many possibilities for the flexibility, however, in the PT System.
• On next pages there is a short summary.
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Traffic system levels;
Hierarchical order

- Geographical Space, 3D space
- Operational networks
- Operator or Carrier
- Vehicle
- Driver
- Passenger
  - Parcel or other load

There are plenty of Actors who will utilize, regulate, make business, etc. in the field of traffic system on all hierarchical levels. To get most profit from PT, they are flexible by nature.
Geographical Space, 3D Space

- Passable and non-passable areas (or space) for one or many modes
- Person’s or dispatcher’s image of the Physical Network
- Traveller’s (person, data packet etc.) experience of Physical network
- Map description
- No real flexibility
Operational networks

- Limited part(s) of Physical Network(s)
  - Links and Corridors, Terminals, Nodes
- Map description
- Traveller’s experience and image of Operational Network
- Can be rigid or flexible geographically, and in time space
- The grade of flexibility varies from some deviations to totally virtual networks in time and space (location).
- The flexibility is executed by travellers(passengers), operators and drivers.
Operator or Carrier

• When a traveller does not want, or is disable to use his/her own efforts in transport, a carrier is needed.
  – Companies in PT

• Typically one main mode and some support modes, or modes in co-operation (examples: no regular PT is possible without walk, feeder systems)

• Typically operating on one main Operational Network

• Flexibility is possible, in several ways (operations, fare collection, tariff)
  – In case of general PT organized by authority the service provider sets the limits for flexibility
Vehicle

- Typically suitable for one Operational Network
- Typically owned by one Carrier/Operator
- On some Operational Networks there is possible to operate without any vehicles (Walk).
- The connections between Operational Networks are at least partly without vehicles.
  - Some rare exceptions exist
- Vehicles may have internal and external flexibility.
- The use of flexibility depends on a driver or an operator.
Module A: Systems and Operations of FTS

Driver

- A special driver is needed on many networks
- Semi- or totally automated systems exist
- The freedom for flexibility varies
- Traveller drives or guides his movement him/her/itself at least on some parts of journey
  - When once boarded in/on a vehicle, in most cases the freedom of passenger’s own flexibility is heavily restricted
Flexible Systems and Operations in Passenger Transport

- Passengers flexibility
- Drivers flexibility
- Vehicles flexibility
- Operators flexibility
Passenger’s flexibility (1/3)

Choose mode

Need of information of mode possibilities.

Always at least some knowledge of network is needed

• Walk all journey
• Vehicle selection
• PT mode
Passenger’s flexibility (2/3)

- Using some self possessed vehicle(s) at least on one part of journey
  - Vehicle in permanent own possession
  - Vehicle (Bike, car) sharing (or hire)
- Booking and information of availability
- Obtain a vehicle
- Completing the trip on suitable network and using a self selected route
- Leaving the vehicle
Passenger’s flexibility (3/3)

• Using some Public Transport (PT) modes
  – Knowledge of operating principles, flexible or non-flexible and degree of flexibility
  – Knowledge of networks including access to PT and transfers within the PT network. Network and route coverage. Fixed or flexible and the degree of flexibility.
  – Knowledge of timetables. Fixed or flexible and the degree of flexibility. Operating time. Departure time for passenger’s desired trip.
  – Possibilities for continuation trip.

• Knowledge is the key element
Driver’s flexibility (1/2)

- Obliged to follow the given route/line and timetable
  - Delivering information to passengers
- At least some own decisions in the route and timetable selection
  - Information of passenger pick-up and egress points
  - Information of desired and fixed timetable
- Helping Passenger, may be none, some or all
  - Boarding and egress of vehicle
  - Helping from vehicle to the door or from door to vehicle
  - Helping inside a house
  - Passenger’s heavy items help
Driver’s flexibility (2/2)

- Delivering information to passengers,
  - General information of the system
  - Information of the on-going journey
    - Possibilities and suggestions of the continuation trip
  - Information of incidents
  - Proposals to avoid problems
  - General information of the operating area

- Utilizing vehicle’s flexibility
- Correct and flexible tariff collection
Vehicle’s flexibility

• Vehicle is a passive element, but it may contain flexibly characteristics established by the operator and run by the driver
  – Flexibility in the internal space. (passenger seats, special seats, cargo space)
  – Ability to use different networks (road, rail, different types of network dependent on the propelling? power)
  – Ability to adapt to the collecting point conditions and to passenger’s disabilities (chassis height adjustment, put out ramp, have a lift)
  – Shared vehicle; i.e. ridership by many
Operator’s flexibility

- Selects the best fitting route (using all available networks) for all passengers
- Selects the best fitting vehicle for passengers
- Operates with flexible vehicles
- Accepts many kind of payments
- Creates tariffs persuading passenger
- Creates enticing image
Operations in Flexible PT

• Booking
• Optimisation
• Vehicle selection
• Information connection between optimisation (TDC) and vehicle
• Administrative operations
• Information
Booking

• There must be some connection between the PT operations and passenger, to transmit the demands for flexibility.
  – Because the need of flexibility is individual by nature, the booking process must contain some passenger information and at least information of the O-D locations, time and nature of special service needed, if they exist. The administration may need more information.
  – Manual or automated, or something in-between
  – Uses IT tools or paper and pen, or something in-between
  – Carried out by the service driver and operator or by a separate body
Optimisation

• The combination of individual transport needs to transport operations is carried out in optimisation.
• There is normally plenty of constraints (available vehicles, network restrictions, passenger’s special needs, rules set by the service purchaser, legal aspects, due to other PT modes, etc.).
• The optimisation may be automated or carried out by a person.
• More sophisticated optimisation takes place in a Travel Dispatch Centre (TDC).
Vehicle selection

- The vehicle selection is a part of the optimisation, but has some special aspects, worth of an own paragraph.
- In many cases the most economic fleet consist of a mix of vehicles in own possession and vehicles hired on ride basis.
  - Typically local taxis, but other possibilities depend on the local conditions
Module A: Systems and Operations of FTS

Information connection between optimisation (TDC) and vehicle

• To guide the vehicles to complete the individual transport tasks some information transfer from the optimisation process (TDC) to the vehicles is needed.
  – Pick up task list from TDC and return the completed lists
  – Radio connection (voice)
  – Mobile phone connections
  – On-board PC
  – Using taxi systems
  – Combination of devices
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Administrative operations

- Flexible systems need more administrative work as regular PT, because every passenger in principle is an individual case.
- The administration must be able to serve both the operator’s own needs and many types of clients, respecting the client’s own administrative rules.
  - Individual fare exceptions and reduced fares
  - Follow-up of time, area, number of trips etc. regulations set by the law or by the client
  - Data collection and storing taking into consideration the conflict situations and privacy issues
  - Reporting demanded by the service purchaser
Information

• The image, not the reality, settles the client’s selection.
• FTS idea marketing for the decision makers needs advanced and well established information.
• Because FTS offers in many cases individual service, there is an urgent need for simple and targeted information of possibilities for all clients.
• FTS may be new for everybody and in principle not fully stabilised.
• FTS needs more skills as regular PT.
• Higher need of advertising and information as regular PT.
• Need of user type-oriented information.
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Primary tasks to evaluate and develop when establishing a new FTS

User Needs Analysis

Negotiations with Other Authorities and Parties (horizontally, and vertically)

Determining
- needs
- costs
- other requirements
- advantages

Technical solutions
- stops
- dispatching
- Negotiations about Contracts

BEGINNING OF THE OPERATION

Marketing and Information

- Political Opinion

- Political Decision
- Budget Reservation

Juridical Issues

Institutional and Operational Development

Year 1

Year 2

Pekka Eloranta
Antti Kalliomäki
Year 2000
The co-operation principles with regular PT

- DRT is difficult to fit in the conventional PT modes’ forms.
- Law and customs. Is there a real violation of other PT modes. Is there a question of prejudice, because DRT is not known.
- The final choice is made by the end-user, and in many conflicting cases the choice is car.
The question of fare level

• Should the fare cover the costs?
• Booking costs collected separately?
• Social reasons for the fare level
• Transport quality aspects on the fare
• Subsidies influence on the fare and overlapping subsidies
Payment method and ticket

- The ticket system should be equal with the existing PT ticket system, but how is it possible?
- The payment method should not be a monopoly of any operator.
- The ticket system must not cause extra machinery or processing costs or special skills. This may be challenging, if there both bus- and taxi-industry are involved.
Operational area

• Size and definition criteria
• Can the rules be different inside the subsidising municipalities/regions and outside?
• The travellers will always have some destinations outside the operational area.
• The operation area must not violate viable regular PT
Travel Dispatching

- Trip designer or trip broker (for the operators)?
- Separate or included in some operator’s organisation?
- What are the effective economic goals, criteria, and indicators for a separate TDC?
- Rules how to deal the transport tasks to vehicles
- Rules how to avoid violation of other PT modes
- Rules how to avoid too great inconveniences for the passengers when combining trips
- Is TDC a general PT information dealer? And in this case is it a dealer without cost or compensation?
Juridical questions in FTS

• As long as the services are pilots and tests, the risks of juridical conflicts are smaller.

• FTS must have equal status with other PT modes: How is this possible, if bus- and taxi-industries have different laws and regulations and FTS is something in-between? How to feed the experiences of FTS into the legislation?

• The bidding and contracting process needs special attention and knowledge and the contract is not a customary PT contract.
Module A: Systems and Operations of FTS

Area wide implementation models

• If FTS is run by municipalities or similar small local authority areas, there must exist an area wide working model for the co-operation. The sensible operation area seldom respects the existing local boundaries.

• Clearing of revenues and costs.

• What is the process and body for the decisions before and during operation of FTS?

• There must be in-built flexibility in the FTS contract, because there always will be unexpected problems
National Social Insurance Institution(s) (NSSI)

- In many countries NSSI pays a considerable amount of all authority offered personal travel subsidies.
- NSSI quite often has a role of payer - within pre-set rules - and is not an active player to diminish the travel subsidy costs.
- FTS can give new opportunities to combine transport efforts and diminish costs.
Module A: Systems and Operations of FTS

Individual information protection

• The smooth running of TDC needs some special information of the clients stored in the system. Address, telephone number, the type of special needs.

• The type of the special needs is typically classified as sensitive information of a person. Nowadays the security is perceived as one of the main values, and even a simple address may be sensitive information.

• This may cause discussion between authorities and TDC registry owner.
The end of the Module A