Quality in Local Public Transport Service

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International Workshop on Benchmarking and Regulation in Transport – Turin, 12th December 2019

Why to improve quality in public transit service?

→ **Direct benefit** to current users of the service

→ **Indirect benefit** in reducing the modal shift towards the privare car (and the related indirect costs linked to pollution, congestion, accidents, road maintainance)

Quality determinants of bus services (1)

(See Eboli and Mazzulla, 2012; Redman et al., 2013; Litman, 2019).

→ Service reliability: respect the departure time and journey time.

→ Comfort: physical condition of the vehicle and livability in the vehicle and at waiting points (seating quality, temperature, crowding, noise and convenience to access the vehicle).

→ Cleanliness: concerning the internal and the external parts of the vehicle and the related facilities (influence on image of the service).

→ Safety and security: concern the probability that the passengers will be involved in an accident (safety) or become the victim of a crime (security).

→ Fare: monetary cost of the journey. Studies show that demand is inelastic to the fare level (Dargay et al., 1999; Dargay et al. 2002; Deb and Filippini, 2010), but it is relevant to manage the trade-off between efficiency, subsidies and affordable fares.

Quality determinants of bus services (2)

→ Information: necessary for potential passenger to be able to use the service (schedule, access points, stops, etc.). Importance of automated "customer information systems" providing e.g. visual or voice support to passenger on board or at the bus stop.

→ Customer care: Attitude of the personnel towards the customer; reliability of online services; reliability and accessibility of the ticket offices.

→ Environmental impact: Recent technological improvements allow important potential reductions in pollution. A correct management of the fleet (acquisitions, operation and disposal) should be oriented to balance costs, level of service and environmental impact.

The passenger satisfaction

→ All the previous points can be important measures of the quality of service provided by the carriers (supply side perspective)

→ However, customers can evaluate very differently each quality determinant

→ it is necessary to understand if and to what extent the various initiatives undertaken by the carriers meet the users' needs.

→ Different perspectives: it is possible to reason in terms of expected quality (a pre-consumption attitude) or perceived quality (related to the use of the service).

→ From the methodological perspective, it possible to rely on two main approaches.

→ Statistical analysis approaches involve methods such as factor analysis, scatter grams, bivariate correlations and cluster analysis. The evaluation often relates attributes to overall satisfaction indexes.

→ Regression models approaches rely on econometric techniques and model the relationship between quality (dependent variable) and attributes (independent variables). The coefficients usually express the relative importance of each attribute. Models can be either linear or non linear.

Statistical analysis: an example

→ Bhave (2002) proposes a Customer Satisfaction Index (CSI)

→ CSI is a percentage

→ It is computed as a weighted average of the scores of the attributes that contribute to customer satisfaction.

Parameter P	Average Weighting (1-10) A	Average Score (1-10) B	Average Unit weighting C	Weighted average score D=B*C
P1	8	6	1.33	7.98
P2	6	8	1	8
P3	2	8	0.33	2.64
P4	4	4	0.67	2.68
P5	9	5	1.5	7.5
P6	7	6	1.17	1.02
	Average P1-P6 =6			CSI index 4.97

Our example from Bhave (2002).

Regression models: an example

→ Hensher et al. (2003) rely on stated choice methods and Multinomial Logit Models (MNL)

→ Interviews to customers of two operators in Sydney. Customers were interviewed during a bus trip.

→ 13 attributes describe the service quality from the customer perspective

→ Each attribute has three levels (e.g. Attribute: "friendliness of the driver"; levels: "very friendly", "friendly enough", "very unfriendly")

→ Three choice set, with three alternative each, were proposed to each respondent.

→ MNL is applied to the choices made. The estimated parameters express the relative weights of the different attributes.

→ Customer were also asked to express an evaluation of the attributes with reference to the current trip

→ These values were multiplied by the estimated weights, and summed up to provide the Service Quality Index (SQI) of each respondent.

→ By taking the average across the passengers it is possible to compute the SQI for each segment

The management of quality

→ EQUIP (The Extending the Quality of Public Transport, 2000 - a project funded by the EC), developed a Handbook for self-assessment of the internal performance of local public transport operators

→ Continuous improvement process

→ Nine stages

1. Define and agree on critical success factors of business

2. Develop indicators to measure performance

3. Measure indicators for an individual operator

4. Compare performance with that of others

5. Identify areas to be improved

6. Review relevant business processes

7. Learn best practice from benchmark partners

8. Plan and implement improvements

9. Monitor performance

Source: EQUIP, p.5

Policies for quality

→ Quality of service is a variable of interest for policy makers, since it is relevant for favoring the switch from private car to public transport, with environmental implications.

→ A fair balance between cost efficiency and quality must be pursued.

→ Subsidies mechanisms, but also the mechanisms designed to grant concessions, can play an important role to provide incentives to reduce costs and improve customer satisfaction.

→ For instance competitive tendering allocate subsidies or grant concessions to operators that ensure given level of service quality and costs at the best practice levels.

→ Performance base contracts allocate incentives on the bases of multiple goal including, for instance, efficiency in costs, benefits for current users and the capacity to attract new users (Norway).

→ Better coordination of the operators by local authorities can improve quality independently from incentives and subsidies. Abrate et al. (2009) show that the number of users can be increased by providing integrated tariffs.

Conclusions

→ Quality of service is an important issue in local public transport

→ There are several attributes defining quality from the supply side perspective

→ They present difference relevance in terms of customer satisfaction → need to deepen the knowledge of customers' preferences.

→ Statistical analysis or regression models are available for reaching this goal.

→ Operators can self-assess their service quality

→ Often regulators are interested in incentivizing quality. They must choose proper incentive mechanisms.

→ They can actively foster quality also by promoting coordination among operators