Station Quality: an Elusive but Worthwhile Concept

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Why is station quality important?
Relative impact of the trip stages on the total travel experience

Quality is an imprecise concept whose current definitions include:

- *n.* a degree of excellence (synonym of grade): *the quality of competing air service*
- *n.* superiority in kind: merchandise of quality
- *n.* a distinguishing attribute (synonym of characteristic): possesses many fine qualities
- *n.* the attribute of an elementary sensation that makes it fundamentally unlike any other sensation
- *adj.* being of high quality

_Merriam-Webster’s Collegiate Dictionary, Eleventh Edition_
Quality

“Quality is a characteristic of thought and statement that is recognized by a non-thinking process. Because definitions are a product of rigid, formal thinking, quality cannot be defined”

“People differ about quality, not because quality is different, but because people are different in terms of experience”.

R.M. Pirsig, ‘Zen and the Art of Motorcycle Maintenance’

Satisfaction

• “When we measure satisfaction what we’re really measuring is the difference between what a customer expects and what a customer perceives he gets”

Dave Power III as cited in Pine and Gilmore, 1999
Sacrifice

• To acquire a product or service, a sacrifice (or price) must be made (or paid)

Effort

• “physical or mental energy needed to do something”
**Time**

- “a non-spatial continuum that is measured in terms of events which succeed one another from past through present to future”

- “…is a personal experience, more dependent upon how you interpret the events than anything else”

**Servicescape**

- the ‘landscape’ in which services are provided provides a clue regarding the quality of service that will be provided

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M. J. Bitner, 1992. Servicescapes: The Impact of Physical Surroundings on Customers and Employees
Value

\[ \text{Value} = \frac{\text{benefited benefits}}{\text{perceived effort} + \text{perceived time}} \]

Generalised Cost Function

\[ \text{GC} = v_{wk} \times A + v_{wt} \times W + \text{IVT} + \frac{F}{\text{VOT}} + I \]

where

- GC: Generalised Cost
- A: total walking time to and from the service (min)
- W: total waiting time for all services used on the journey (min)
- \( v_{wk} \): weighting factor applied to time spent walking
- \( v_{wt} \): weighting factor applied to time spent waiting
- IVT: total in-vehicle time (min)
- F: fare
- VOT: Value Of Time
- I: Interchange penalty
  (normally calculated as a time penalty multiplied by the number)
A visualisation of the GCF

Quality of Access

- accessibility of housing and destinations
- quality of local public transport
- relationship of the bus stops etc. and the station
- easily accessible destinations on the rail network
- frequency of service
Quality of Movement

Impact density on perception of time

Density: pedestrians per square meter

- Waiting
- Walking

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Quality of the Waiting Experience

- uncertainty regarding the actual departure time
- uncertainty regarding a seat in the train
- standing space and benches
- distractions
- temperature, draft
- ‘sensory stimulation’

Quality of the Station Environment

- architecture
- aesthetics
- atmosphere
- sightlines
- colour, light, materials
- state of maintenance and cleanliness
Quality of Ancillary Services

- retail en food
- advertising (as visual distraction)
- entertainment and music
- free newspapers
- wifi
- toilets
Quality of the network of stations

- branding en image
- standard signing
- good furniture

Station Quality Index

\[ SQI = f_{sf} \cdot f_{qa} \cdot t_a + f_{pat} \cdot f_{qmh} \cdot t_h + f_{pat} \cdot f_{qmv} \cdot t_v + f_{sf} \cdot f_{qw} \cdot t_w + f_{qse} + f_{qas} + f_{qns} \]

where

- \( f_{sf} \): represents a function of service frequency
- \( f_{qa} \): represents the quality of access
- \( f_{pat} \): represents a function of perceived available time
- \( f_{qmh} \): represents the quality of horizontal movement
- \( f_{qmv} \): represents the quality of vertical movement
- \( f_{qw} \): represents the quality of the waiting experience
- \( t_a \): represents the clock time accessing the station
- \( t_h \): represents the clock time moving horizontally
- \( t_v \): represents the clock time moving vertically
- \( t_w \): represents the clock time spent waiting
- \( f_{qse} \): represents the quality of the station environment
- \( f_{qas} \): represents the quality of the ancillary services
- \( f_{qns} \): represents the quality of the network of stations
Transfer Penalty

Transport for London: the average passenger will choose to accept a route that is up to 4 minutes longer to avoid having to transfer

- In such an calculation the transfer penalty includes all of the walking and waiting time and the effect of additional effort, congestion, unpleasantness etc.

- The penalty at an agreeable station with reasonable walking distances, escalators and limited congestion will be lower than at a disagreeable station

Transfer penalties in London

![Map of Transfer Penalties in London](image)

Average = 4.9
Earl’s Court & South Kensington

Sightlines and quality of the walking route
End

Amsterdam Centraal in the year 2000 by Rudolf Das (1967)