

# Determinants of Public Transport Quality of Service

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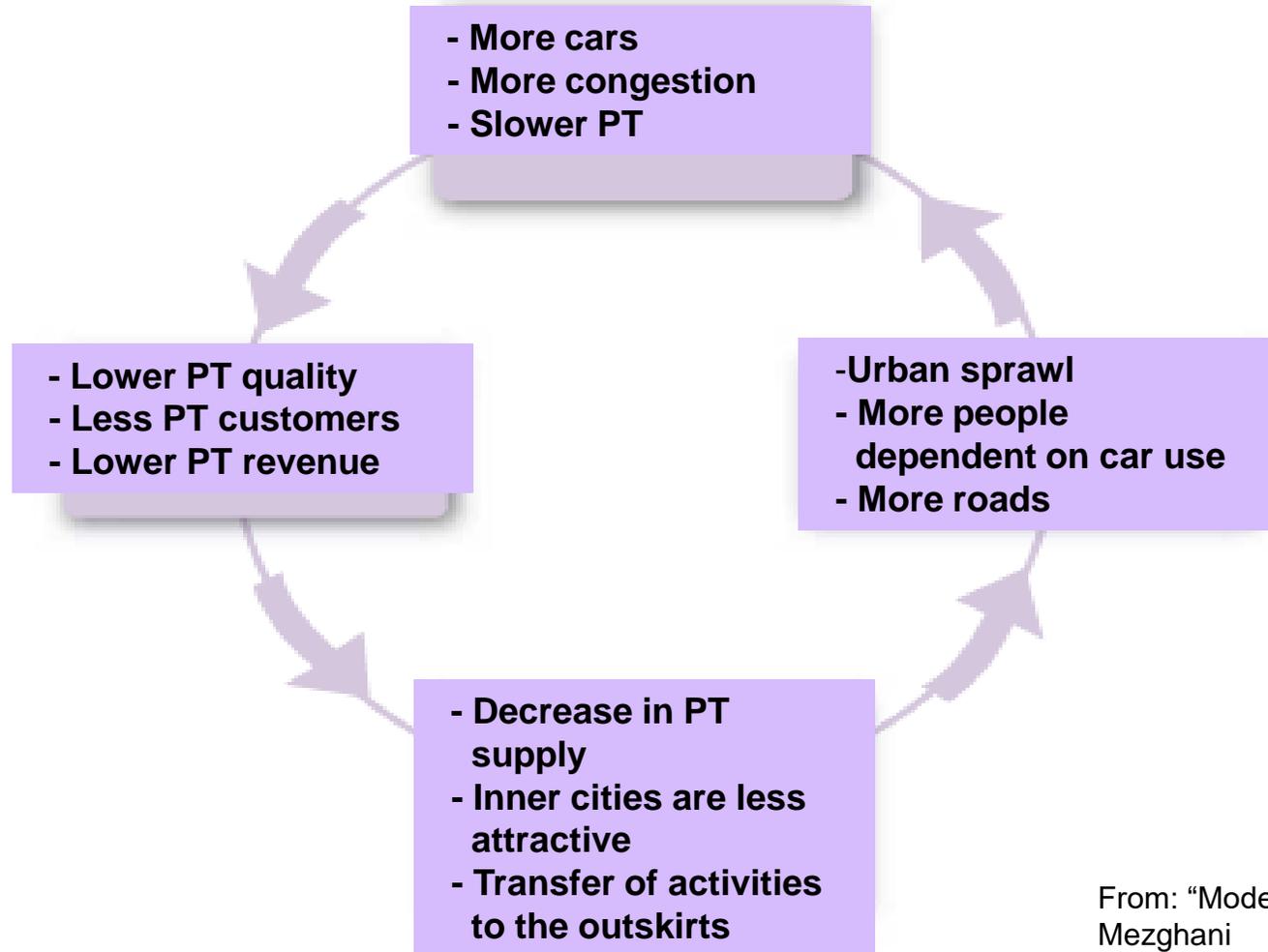
# Known facts about urban mobility

- Urban sprawl
- Growing car ownership
- Increasing traffic congestion
- Improved energy/environmental technologies but lower energy/environmental performances
- Increasing energy prices

# Known advantages about Public Transport (PT) (Did we achieve all of these?)

- costs less to the community
- needs less urban space
- is less energy-intensive
- pollutes less
- is the safest mode
- improves accessibility to jobs
- offers mobility for all

# The vicious circle of urban mobility decline



From: "Modern and efficient public transport system" by Mohamed Mezghani

# Quality of service

- Depends on the perspectives of three key players:
  - (1) the passengers or the users,
  - (2) the administrators, and
  - (3) the operators.



<https://indianexpress.com/article/india/india-news-india/cabinet-approves-mumbai-urban-transport-project-4404328/>

# PT quality of service can be evaluated from various perspectives, including:

- Availability (when and where transit service is available), and coverage (the portion of a geographic area, or the portion of common destinations in a community, located within reasonable distance of transit service)
- Frequency (how many trips are made each hour or day)
- Travel speed (absolute and relative to automobile travel)
- Reliability (how frequently service follows published schedules)
- Integration (ease of transferring within the transit system and with other travel modes)

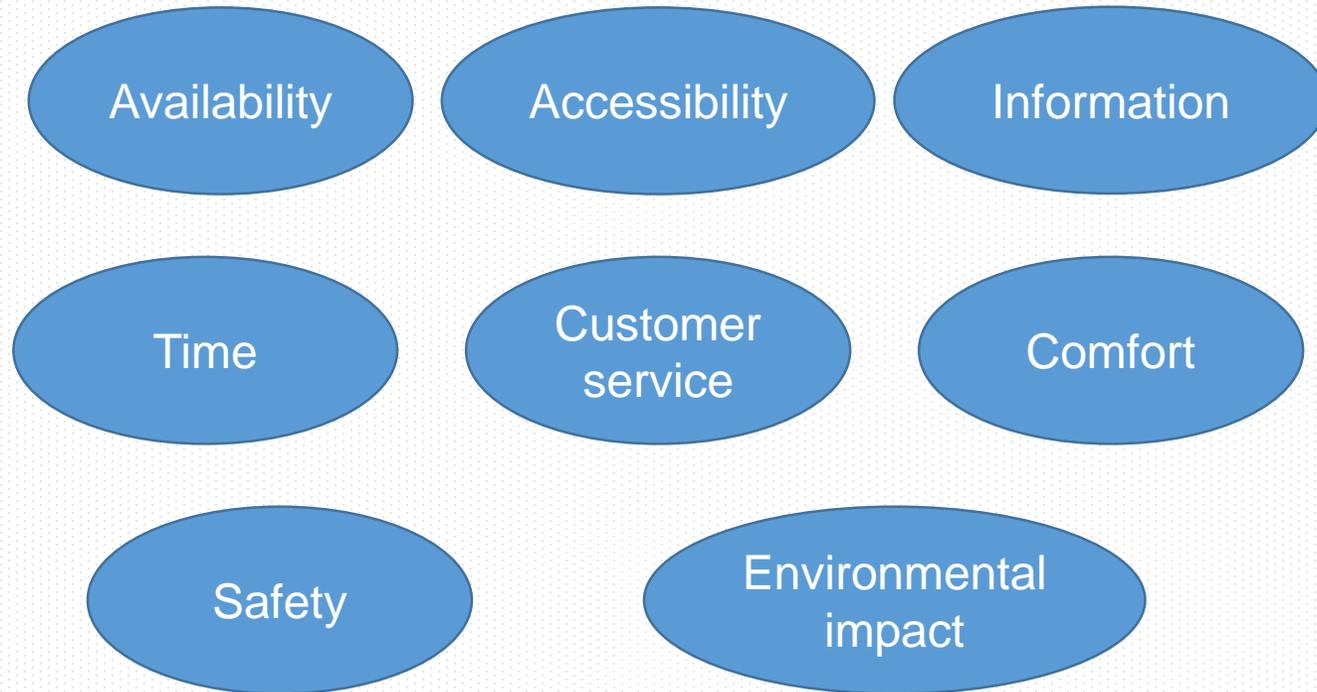
(AARP (2005); Dhinghi (2011); Hale (2011); Kenworthy (2008); Kittleson & Associates (2013); Litman (2008 and 2014); Marsden and Bonsall (2006); Stradling, et al. (2007); Todd Litman (2018); TRB (2010); Tomer, et al. (2011); Tumlin, et al. (2005))

- Price structure and payment options
- User comfort and security, including riding on, walking to, and waiting for transit
- Accessibility (ease of reaching transit stations and stops, particularly by walking)
- Universal design (ability to accommodate diverse users including people with disabilities, baggage, inability to understand local languages, etc.)
- Affordability (user costs relative to their income and other travel options)
- Information (ease of obtaining information about transit services)
- Aesthetics (appearance of transit vehicles, stations, waiting areas and documents)
- Amenity (extra features and services that enhance user comfort and enjoyment)

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# European Union (EU) standards UNE-EN13816 and UNE-EN15140

The attributes representing the service quality are grouped into eight areas namely,



This standard attempts to **establish the common framework** between **administrators and the operators, and the customers** for defining the **quality of service**.

# United States has developed the Transit Capacity and Quality of Service Manual

- Factors of availability
- Factors of comfort and convenience



<https://transportnsw.info/travel-info/using-public-transport/travelling-with-prams-young-children>

# Factors of availability

- Spatial availability
- Temporal availability
- Information availability
- Capacity availability

# Spatial availability

- Is there a transit stop within walking distance?
- OR is demand responsive or private shuttle service available?
- OR is a car AND a convenient park-and-ride available?
- OR is a bicycle AND bicycle storage available?
- OR is a bicycle available AND can it be brought on board?

# Information availability

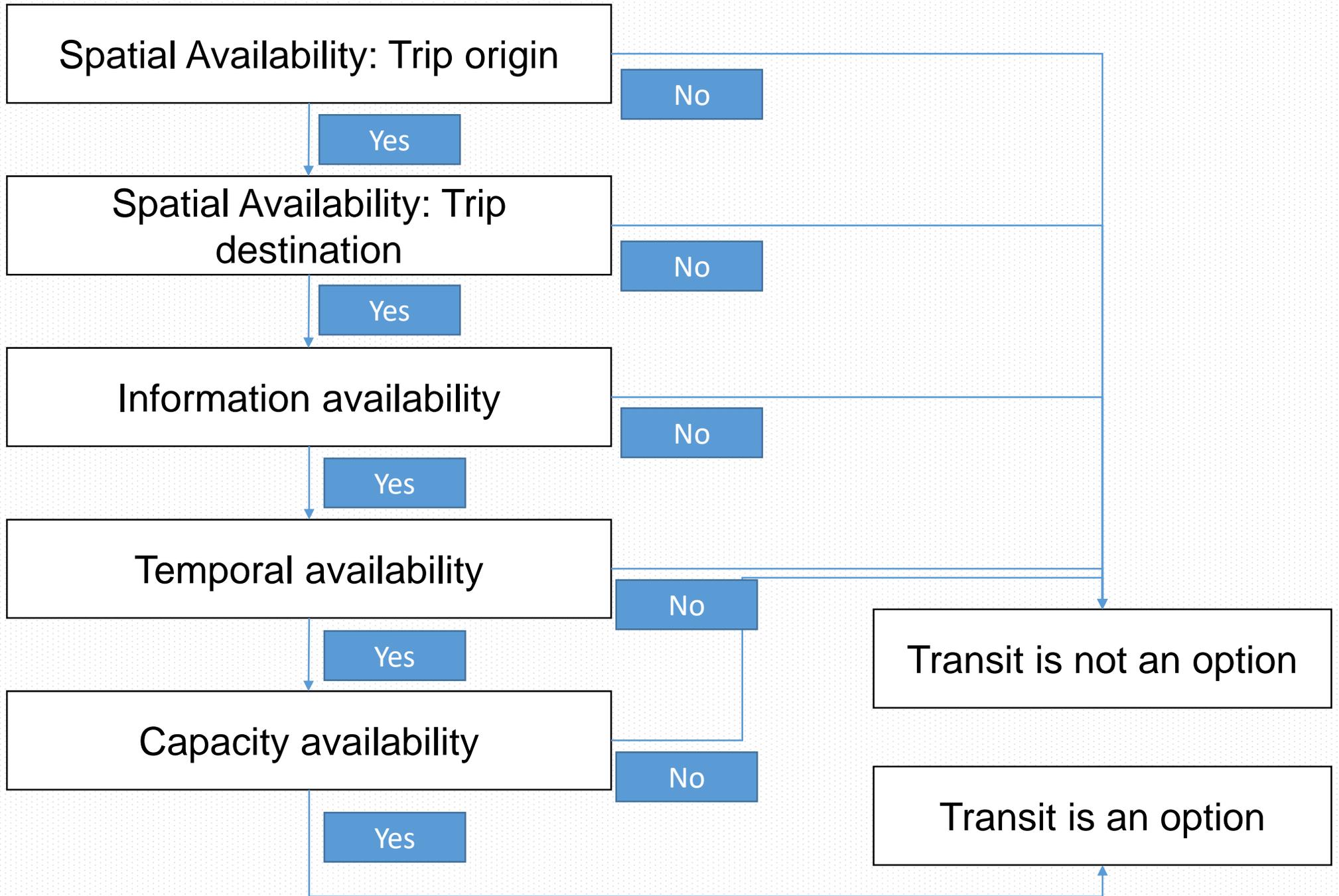
- Are the schedule and routing known?
- OR is telephone, text, or Internet information offered, the No service available when customers use it, and the information accurately provided?

# **Temporal availability**

- Is service offered at or near the times required?

# **Capacity availability**

- Is space available on the transit vehicle
- AND (if applicable) at the park-and-ride?



# Factors of comfort and convenience

Is the service reliable?

How long is the wait? Is shelter available at the stop while waiting?

Are there security concerns-walking, waiting, or riding?

How comfortable is the trip? Will I have to stand? Are there an adequate number of securement spaces? Are the vehicles and transit facilities clean?

How much will the trip cost?

Is a transfer required?

How long will the trip take in total? How long relative to other modes?

# Key message from TCQSM

- Quality of service reflects the kinds of decisions a potential passenger makes, consciously or not, when deciding to whether to use transit or another mode, usually the private automobile.
- There are two parts to this decision process: (1) assessing whether transit is even an option for the trip, and if so, (2) comparing the comfort and convenience of transit to competing modes

# Public transport Quality of Service – Indian standards

- To the best of authors knowledge we didn't find any particular standard discussing the quality of service
- Do we need one? Yes
- Essential addition for Indo-HCM

- Institute of Urban Transport India has documented ways for the service level benchmarking of urban transport (Handbook on service level benchmarks for urban transport)
  
- Indicators to calculate City-wide Level of Service (LoS) of Public Transport Facilities as per IUT
  - 1) Presence of Organized Public Transport System in Urban Area
  - 2) Extent of Supply Availability of Public Transport
  - 3) Service Coverage of Public Transport in the city
  - 4) Average waiting time for Public Transport users
  - 5) Level of Comfort in Public Transport
  - 6) % of Fleet as per Urban Bus Specification

# Measuring quality of service – using surveys

- User surveys are an essential tool for collecting the information used to analyse quality (e.g., customer satisfaction survey are widely adopted)
- These are questionnaires where customers are asked to rate satisfaction or performance perception on each key service attribute

# Measuring quality of service – using surveys

- Customers are asked to rate the importance of each attribute, or rank them, and the global overall service satisfaction (e.g., Friman and Gärling 2001; Joewono and Kubota 2007a, c; Koushki, Al-Saleh, and Al-Lumaia 2003)
- They are asked to rate each attribute in terms of both perceptions and expectations (e.g., Lin, Lee, and Jen 2008; Sultan and Simpson 2000)
- Or to rate global service, in terms of both perceptions and expectations (Eboli and Mazzulla 2012b)

# **E.g., Customer satisfaction survey NSW, Australia (2018)**

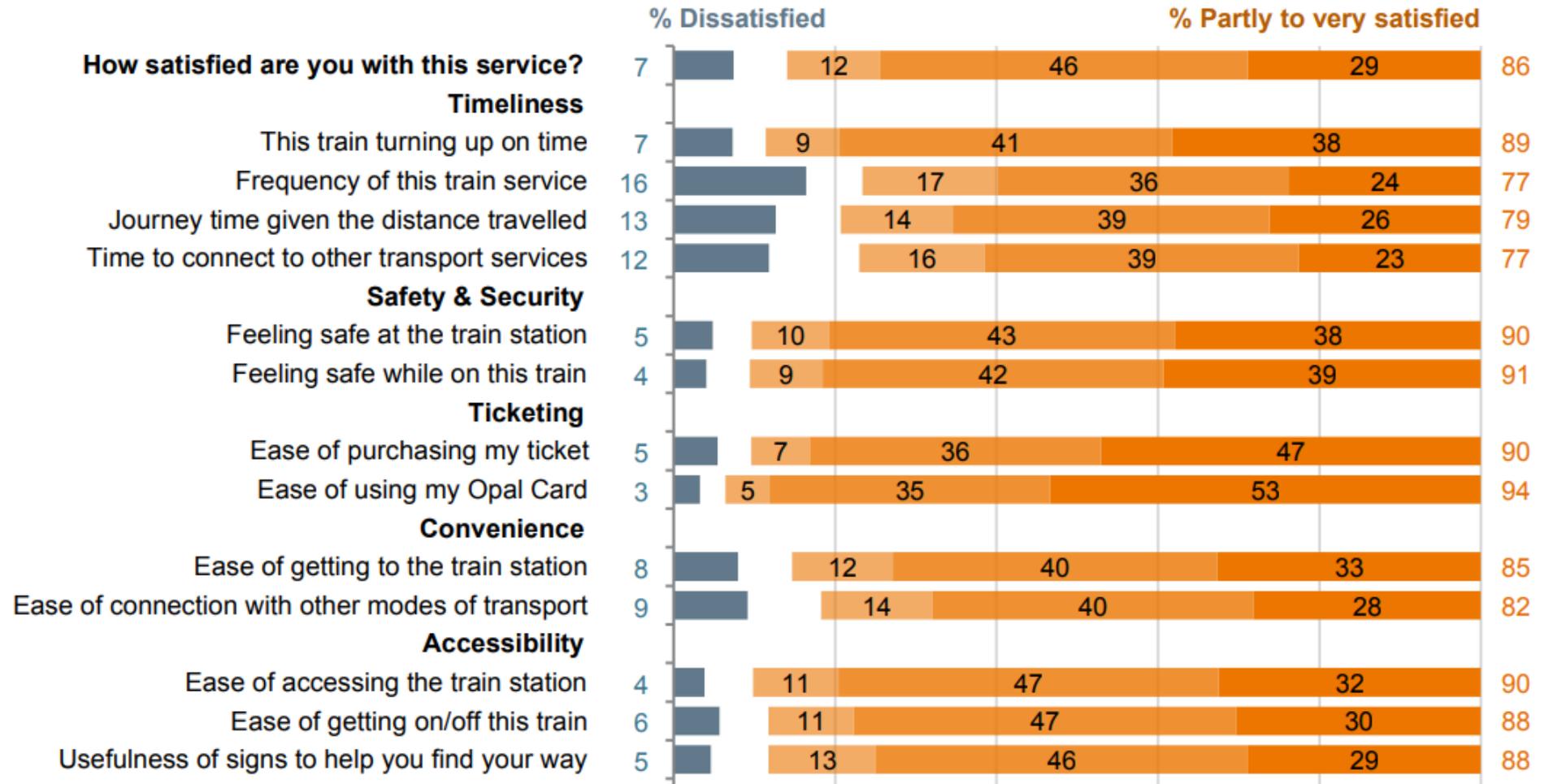
- The survey was designed by the Customer Services Division of Transport for NSW to ensure that it measured the service attributes that customers value the most
- The Customer Services Division used customer research to determine what drives customer satisfaction levels across the various modes
- This information was then used to design the questions in the surveys
- The results present what customers value most, focusing on the top nine customer service priorities including timeliness, safety & security and comfort

- The Customer Satisfaction Index May 2018 includes responses from more than 16,000 customers across four transport modes: train, bus, ferry and light rail

## **Eligibility**

- Customers were selected to participate in the survey for train, bus, ferry and light rail while travelling on a typical day of a typical week
- A typical day includes weekdays and weekends, but does not include school holidays, public holidays or special events
- Customers under 17 years old were excluded from the survey and surveys were not distributed to school children in uniform

# Questions and Results

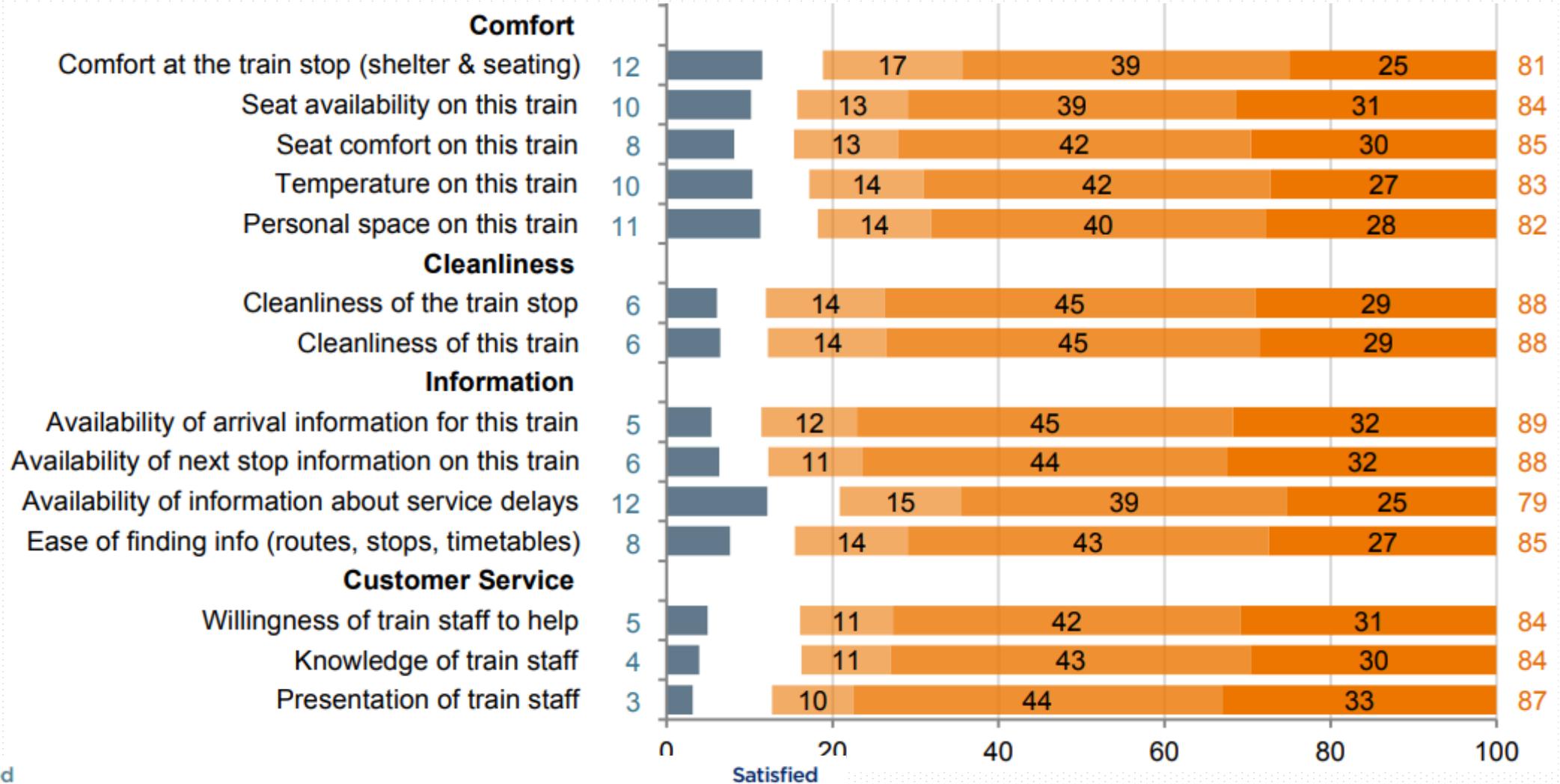


Dissatisfied

Satisfied

1	2	3	4	5	6	7
Very Dissatisfied	Dissatisfied	Partly Dissatisfied	Neither Satisfied nor Dissatisfied	Partly Satisfied	Satisfied	Very Satisfied

# Questions and Results



Dissatisfied

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# Ways for analysing the quality of service

- Methodologies based on the differences between the expectations and perceptions
- Methodologies solely based on the perception of quality
- Both the approaches, one way or the other, are based on the differential importance of attributes in the view of customers
- It is important to investigate the relative importance of different service quality attributes **from the customer's viewpoint**

# Important issues and this research study

- Most of the research and standards focus on developed economies
- Problems such as limited availability of funds, limited intelligent telematics facility, population overload, environment pollution, and congestion often haunt the PT service in developing economies

# Important issues and this research study

- In developing economies - unfortunately only a few PT agencies focus on providing comfort and convenience to passengers

Example:

If you are familiar with a PT service of a city in a developing economy,

Does that service suits the requirements of

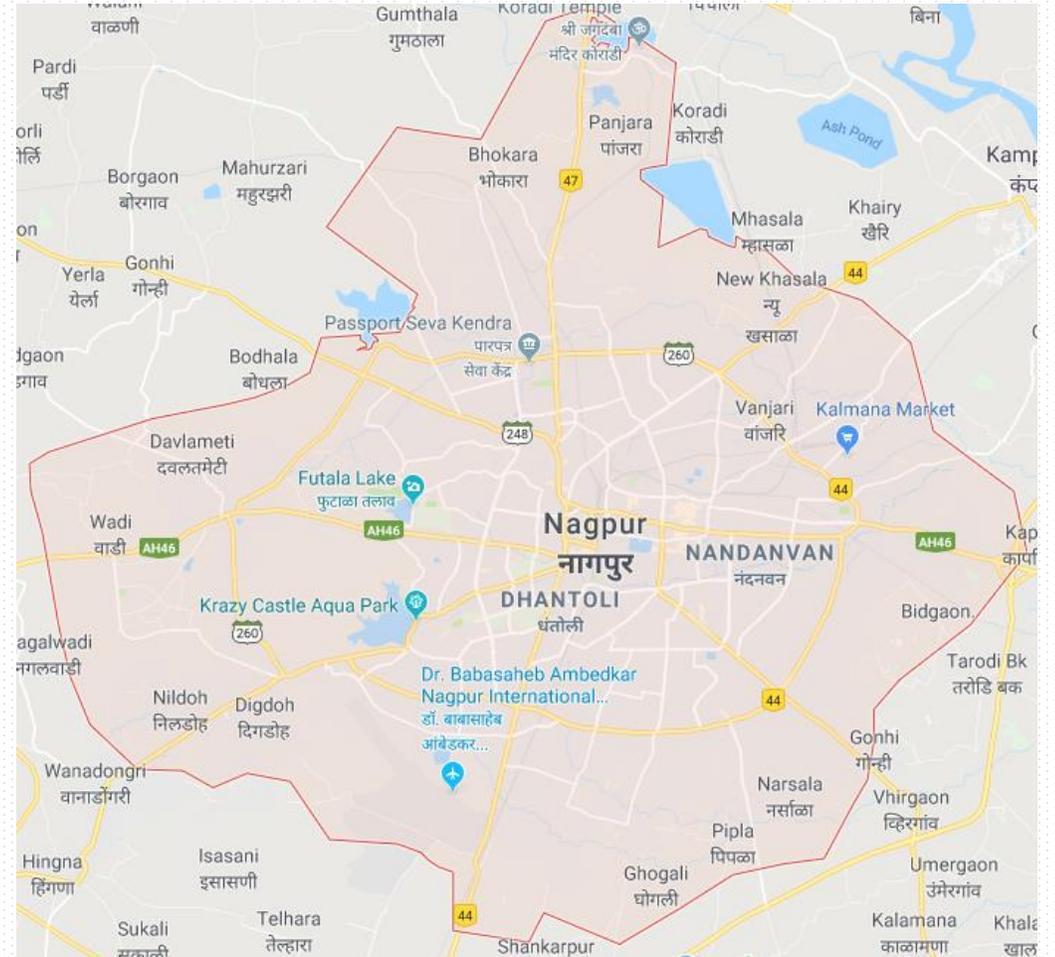
- a) Physically challenged individuals
- b) Senior citizens
- c) Expectant mother/ parents with prams

# Important issues and this research study

- It is critical to judge the PT quality of service time-to-time so as to keep a track of quality standards and accordingly frame a policy to attract passenger usage
- This study primarily focusses on reviewing the existing standards and guidelines for the quality of service and reviews the approaches to analyse quality of service (shown in previous slides)
- Conduct a case study of a bus service operating in an Indian City (future tasks)
- We focus on India, a fast-growing economy

# Case study

- We aim to estimate the quality of a bus service from passengers' perspective using survey data
- The city under study is Nagpur in the state of Maharashtra, India
- Nagpur has a fleet of around 450 buses having an average seating capacity of 44



Source: Google Maps

# Survey and Study contribution

- The survey will be carried out via a combination of manual and online surveys
- The target sample size is 5000
- The design of the survey will be based on the existing research and following the fundamental principles of the survey design
- The findings of this study can provide essential recommendations to improve public transport quality of service and develop much needed public transit quality standards for developing countries