Integrated Multi-modal Public Transport:
Planning and Designing Urban Transport Interchanges in Dhaka City

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About Myself

- ITS, LU: PhD (2010-2013)

- Jahangirnagar University, Dhaka, Bangladesh
  Department of Urban & Regional Planning (DURP)
    - BURP / MURP / MPhil & PhD

- 250 Students
- 7 Support Staffs
- 20 Faculty Members

Integrated Multi-modal Public Transport: Planning and Designing Urban Transport Interchanges in Dhaka City
Introduction

- EU Whitepaper Transport Policy: Inter-modality is key factor of daily mobility
- Integrated multi-modal PT: “seamless” journey / travel
  - Many benefits (convenience and comfort of users)
- Interchanges are crucial in multi-modal integrated transport system
  - Principal shop window for PT system
  - Provide access to PT & transfers between PT (action + location)
  - Transfers are perceived as a “penalty”
  - Interchanges can help to reduce penalty [by facilitating transfers & minimising disruption]
  - To match “form & function” effectively
- Common guidelines & government practices have been developed for transport interchanges
  GUIDE (EC DG,2000); Bus & Coach Station Design & Operation (DfT,2011)
- Little research on interchanges (mainly focused on the topic of quality linked to a single means) – Developing Country
Purpose

- What are the important factors or aspects need to consider while planning and designing of urban transport interchanges?

- Good practices or factors derived from Global North is transferable in developing country cities?
  - What should be done (e.g. factors need to add or remove to adapt with the local contexts) for transferability?
Methodology

- Review of literature
- Visit to several interchanges in UK
- Discussions with transport professionals in Dhaka city.
  - Photos of good practices (from UK interchanges) were shown during discussion
- On-going (not yet analysed data from the case study)
Literature Review

- CityHUB (EC 7F Project)
  - Methodology for strength & weakness of urban interchanges
  - Evaluating perceived quality of urban interchanges
  - 26 cities
  - 37 variables (8 category)


- NODES (EC 7F Project)
  - Toolbox for design/operation (& upgrade) of urban interchanges
  - SE- Station Experience Monitoring tool (Dutch Railway)
  - 9 sites
  - 30 variables (6 category)
Major Factors
EU PROJECTS

CityHUB
• Access & Time
  - Time & movement
    o Distance/ Time/ Coordination
    o No of elevators, escalators, moving walkways + crowding (ease of movement)
  - Access (ease to interchange)
• Information
  - Travel information
  - Way-finding information
• Convenience
  - Comfort & convenience
  - Image & attractiveness
• Safety
  - Safety & security
    o Feeling secure
    o Safety (on/off transport; Inside interchange)
  - Emergency situation
    o Signposting (of emergency exits)
    o Location of exits (event of emergency)

NODES
• Access
  - Easy to get station/ Buy ticket/ Boarding
• Orientation
  - Good overview of station
  - Clear Signage + Travel info displayed
  - Know where to find information
• Ambience
  - Atmosphere/Sound/Tidy/Colorful+Outside
• Comfort
  - Waiting / Climate protection & Standard
  - Enough Space + Aesthetic facilities
• Safety & Cleanliness
• Staff (Visible + Obliged + Professional)

37 variables

30 variables
Case Study Location
Plan of the BRT Station
Initial Results
Planning and Designing Urban Transport Interchanges in Dhaka City

• Interchange “as a transport node” + “as a place”

• Ticketing
• Information
• Images & Attractiveness
• Emergency situation

• Physical issues
• Environmental / supply

“As a Transport Node”
• Information
  Before trip + At interchange
• Transfer Condition
  Distance + Coordination operators

“As a Place”
• Design & image
• Environmental quality
• Comfort of waiting time
• Service facilities
Pre-determined Fare Structure for Rickshaws when Integrating with BRT Systems

CODATU 2017
Introductions

- Rickshaw trips: Short distance, flexible
- Rickshaw fare: determined through a bargaining process
- Integrated multi-modal transport systems
- Without fare integration of rickshaws with public transport there would not be the ultimate benefits/convenience of PT users
  - A passenger have to approach many pullers (one after another) until he finds one willing to carry him with his desired rate – this will create crowding and congestion in front of station, delay in transfer, and inconvenience of passengers.
- Unless a pre-determined fare structure is established for rickshaws, it would be impossible to implement an integrated fare system
- Objective: Understand the possibility of a pre-determined fare structure for rickshaws (to facilitate fare integration between rickshaws and BRT systems)
Review of Literature
PRE-DETERMINED FIXED FARE STRUCTURE FOR RICKSHAWS

- Very few literature on this topic

- Distance-based
  - Predetermined (tentative) distance between two locations
  - Operate only within a locality or neighbourhood for short distances

- Travel time-based
  - A chart of pre-determined fare rate available in each rickshaw
  - All rickshaws nationalised, passengers pre-pay by purchasing ‘tokens’ (e.g. ‘flexiload’ phone-credit system)

- Criticisms: Speed of rickshaw varies (age/strength of puller, quality of rickshaw)
Methodology

- Empirical study with 2 case study locations (prospective BRT station) in Dhaka city.

- 11 FGDs with different stakeholder groups and rickshaw pullers.

- Semi-structured open-ended interviews of 25 transport professionals/policymakers.
Case Study Locations
Results from Case Study at Dhaka

NEEDED PRE-DETERMINED FARE STRUCTURE FOR RICKSHAWS?

- Arguments both for and against
- Participants in user-based FGDs Vs puller-based FGDs

FOR:
- Convenience (no waiting/arguing)
- Pullers maintain a queue while waiting
- Female passengers: Bad comments

AGAINST:
- Like bargaining (could charge more)

Interviews:
- Passenger know travel cost
- Pullers know how long to work
- Happened in a few areas e.g. Gazipur

Difficult to enforce
Difficult to determine correct fare
Rickshaw fare change constantly
Para-transit: Market demand/supply
In a particular route or between major locations in Dhaka:
- Rickshaw fare is already becoming determined at an acceptable rate (for both the pullers and users) through the market force itself.
- Fare between certain locations becomes settle for a period of time by the Demand-Supply of market.

Possibility of arguments and disputes in the end of trip

Example of Easyride operating at Mirpur
- Examples of pre-determined fare structure for rickshaws in cantonment DOHS and Kamalapur (several years ago)

Rickshaw operation must be localised
FGDs Participants

- Fare based on distance between two locations
- Based on an agreed pre-determined (tentative) distance, not the true distance in km
- Possible only if rickshaws operate within a locality (different colour/design)
- LG + Stakeholders + pullers (owner’s association / top of administration / social elites)
- Fare chart
## Results from Case Study at Dhaka

**HOW TO DETERMINE A FIXED FARE STRUCTURE?**

Interviews: 15 participants mentioned possible

- Rickshaw’s operation localised (within neighbourhood)

<table>
<thead>
<tr>
<th>Methods</th>
<th>Description</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area/ locality Based</td>
<td>Hypothetically delineating the neighbourhood and a fixed rate for trips within the area or outside the area</td>
<td>5</td>
</tr>
<tr>
<td>Time Based</td>
<td>Measuring the time of rickshaw trip and determining a rate for per hour or minute</td>
<td>3</td>
</tr>
<tr>
<td>Distance Based</td>
<td>Identifying tentative distance between two locations; determining a fare for that trip</td>
<td>7</td>
</tr>
</tbody>
</table>
• Two sets of fare structure: Peak hours Vs Off-peak
  • Issues/ problems: deciding on peak hours; how to enforce different rates; if a trip starts in off-peak but terminates in peak or vice-versa.

• A standard fare structure for throughout the day

• Maximum two adults and two accompanying infant children travelling together
Pullers may not follow; e.g. Auto-rickshaws, taxi

Concerns of pullers group:
  • A small group of pullers may possible to unite
  • Pullers usually operate in different areas
  • Price of commodities has direct influence on rickshaw fare

Suggestions:
  • Deploying a traffic warden at BRT station
  • Rickshaw owner’s responsibility (to order the puller)
  • Strong law and effective enforcement
  • Awareness generation among the pullers

Interviews
  • Participatory approach in decision-making process
  • Enforcement + Willingness of pullers
  • LG fix fare rate + Fare chart + Revise the fare rate regularly
Results from Case Study at Dhaka

HOW OFTEN THE FARE SHOULD BE REVISED?

- Previous initiatives (e.g. Savar, Gazipur) did not function:
  - Fare structure was not revised regularly
  - Rickshaw fare usually increase with price of essential commodities

- Regular /periodic update and revisions of fare rates
  - When price of commodities increase
  - When price of fuel increase
  - During annual Budget

- 2-3 times per year would not be practical
- Majority suggested for revising once in each year
Results from Case Study at Dhaka
INTEGRATION OF RICKSHAW FARES WITH BRT SYSTEMS

- A pre-determined fare structure for rickshaws – is a must.
- Rickshaw operate within a locality: possibility of pre-determined fare

- Pre-determined fare for rickshaws - integrating with the tickets of public transport system

- Mechanism for integrated fares: Suggested options are -
  - Rickshaw services provided by BRT operator within the locality (pullers would receive a monthly or daily salary)
  - A pre-paid tokens to pay the fare for rickshaw trips; which the pullers would reclaim his earning from the BRT company.
  - BRT tickets sold by pullers (as a vendor of BRT ticket seller), where passengers will pay the total price (for trips both on rickshaws and BRT) to the puller and get the BRT ticket while boarding rickshaw.
Results from Case Study at Dhaka

SUMMARY

• For integrated fare system: pre-determine fare structure is essential for rickshaws

• Rickshaw operate within a locality /neighborhood

• Rickshaw fare based on tentative distance (between two locations) or a demarcated area within a distance

• Fare chart (large billboard at station/major points)

• Participatory approach, stakeholders (LG lead)

• Pullers’ & owners’ awareness and training + Monitoring & enforcement

• Revise fare rates each year
CONCLUSIONS

• A potential solution for establishing a pre-determined fare structure for rickshaws to enable fare integration with urban PT systems.

• The outcome will generally enhance the use of informal transport mode in many developing cities.

• The results might be helpful in formulating policy for other informal modes.
Thank You

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