

USERS' PERCEPTION OF INCREASING OPERATIONS OF ELECTRIC RICKSHAW (TOTO) SERVICE : CASE OF UTTARPARA, INDIA

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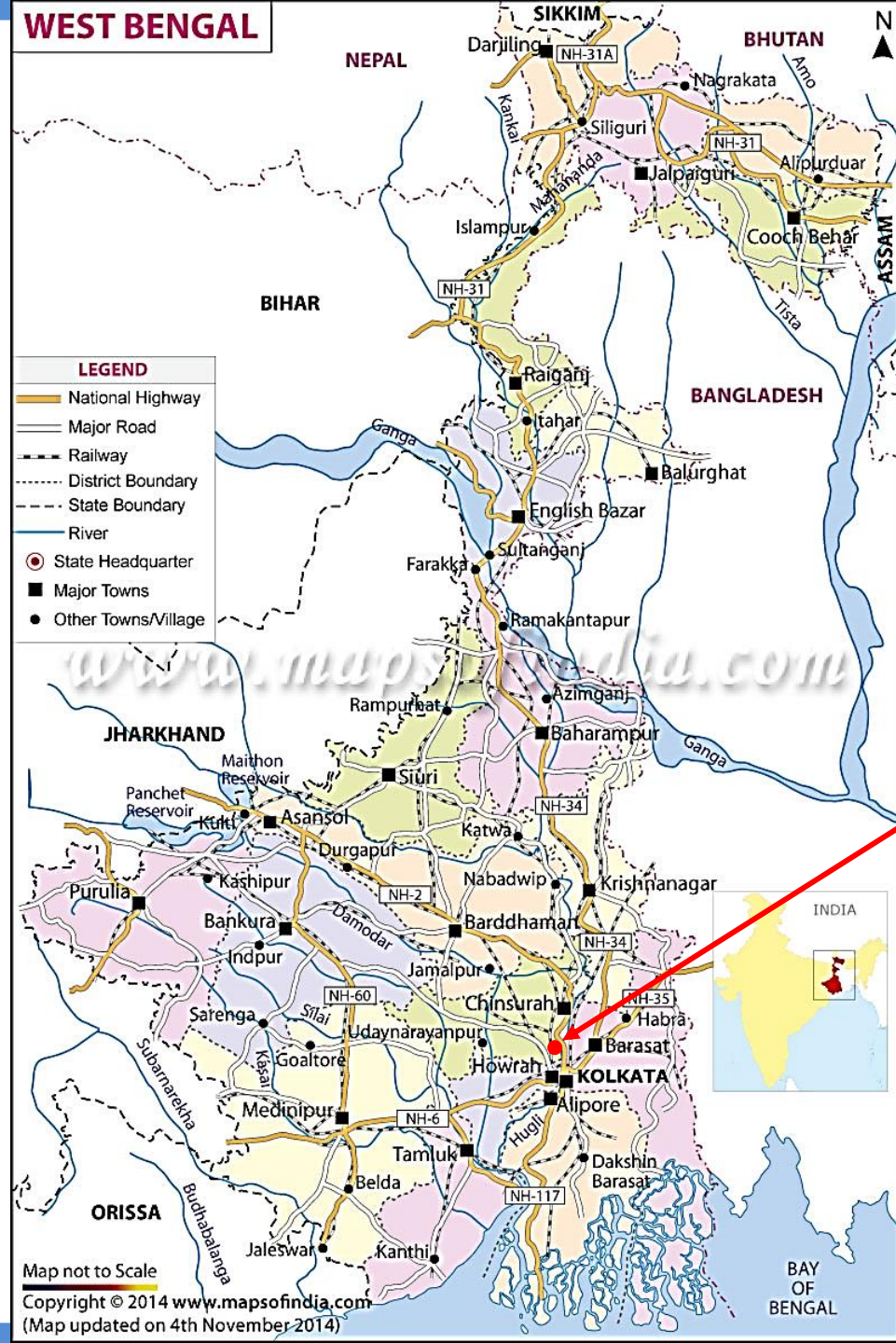


INTRODUCTION



WHAT ORIGINATED THIS STUDY ?

WEST BENGAL



LEGEND

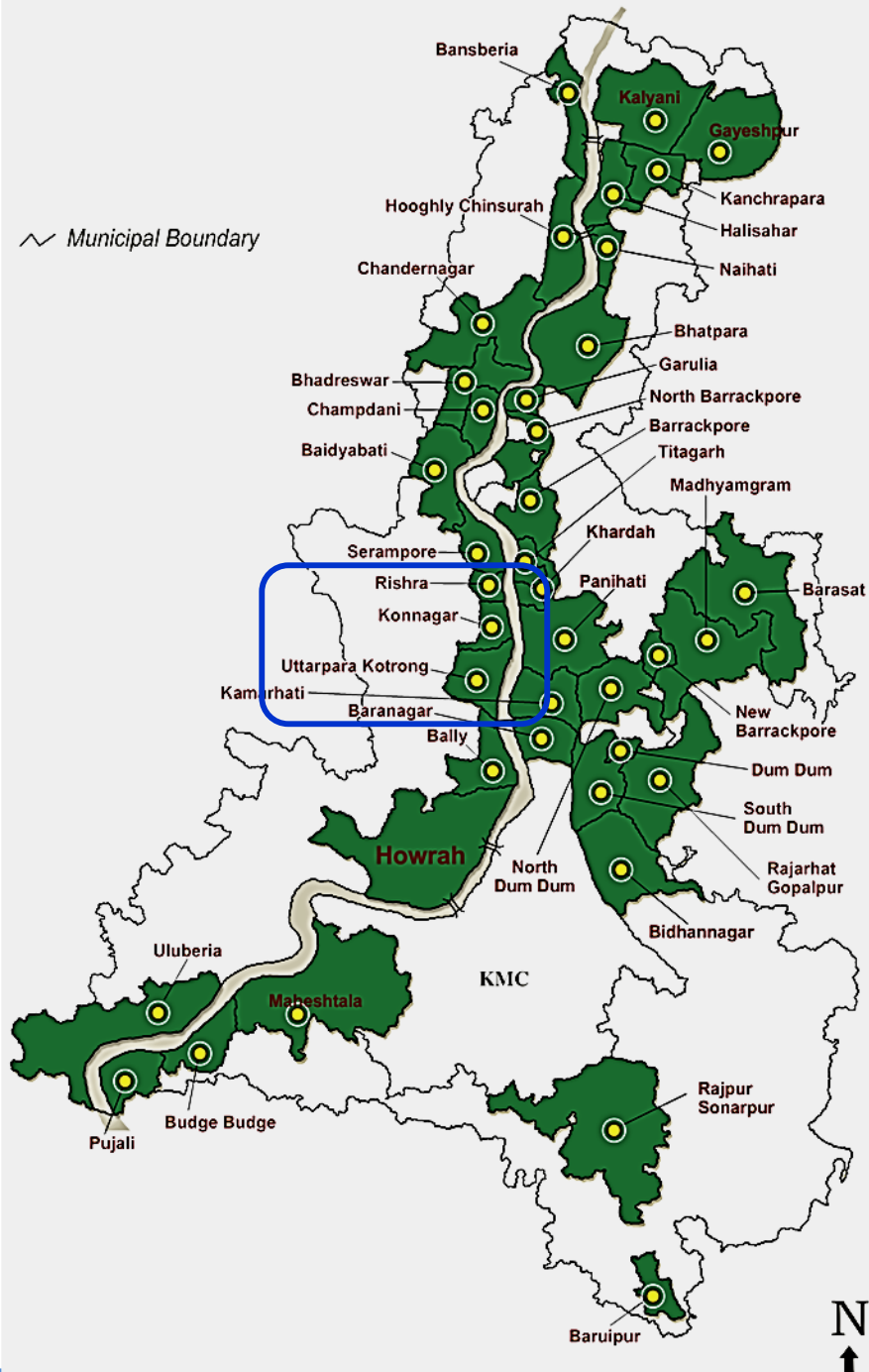
- National Highway
- Major Road
- Railway
- District Boundary
- State Boundary
- River
- State Headquarter
- Major Towns
- Other Towns/Village

Uttarpara-Konnagar

KOLKATA METROPOLITAN AREA IN WEST BENGAL



Uttarpara-Konnagar



A city of “daily-passengers”

- **Uttarpara** : approximately 150,000 population, 10,000 person / sqkm density
- Uttarpara and Konnagar : economically dependent on Kolkata and Howrah in the south and south-east.
- Municipalities in the north : economically dependent also on Serampore, Chandernagore



WHY THIS STUDY ?

- Proliferation of electric three-wheeler rickshaws in the suburbs of Kolkata
- Uttarpara-Kotrung and Konnagar are adjacent municipalities that are heavily dependent on paratransit to connect them to Kolkata and Howrah.
- Infrequent buses, narrow interior roads : dependence on auto rickshaws and cycle rickshaws
- Totos were introduced in 2014 and now there are 800-1000 tolos in the two municipalities combined.





The concept of

SMALL CAPACITY FEEDER VEHICLES AND PARATRANSIT



Shared auto (Kolkata and suburbs)

fixed route, fixed (!!!) fare



Toto – shared and reserved

4 seater by design, 5 / 6 by “adjustment”



Toto – shared and reserved

6 seater by design (not seen in study area)



Toto – shared and reserved

Smaller in number (one in Study area)



Cycle rickshaw - pedal



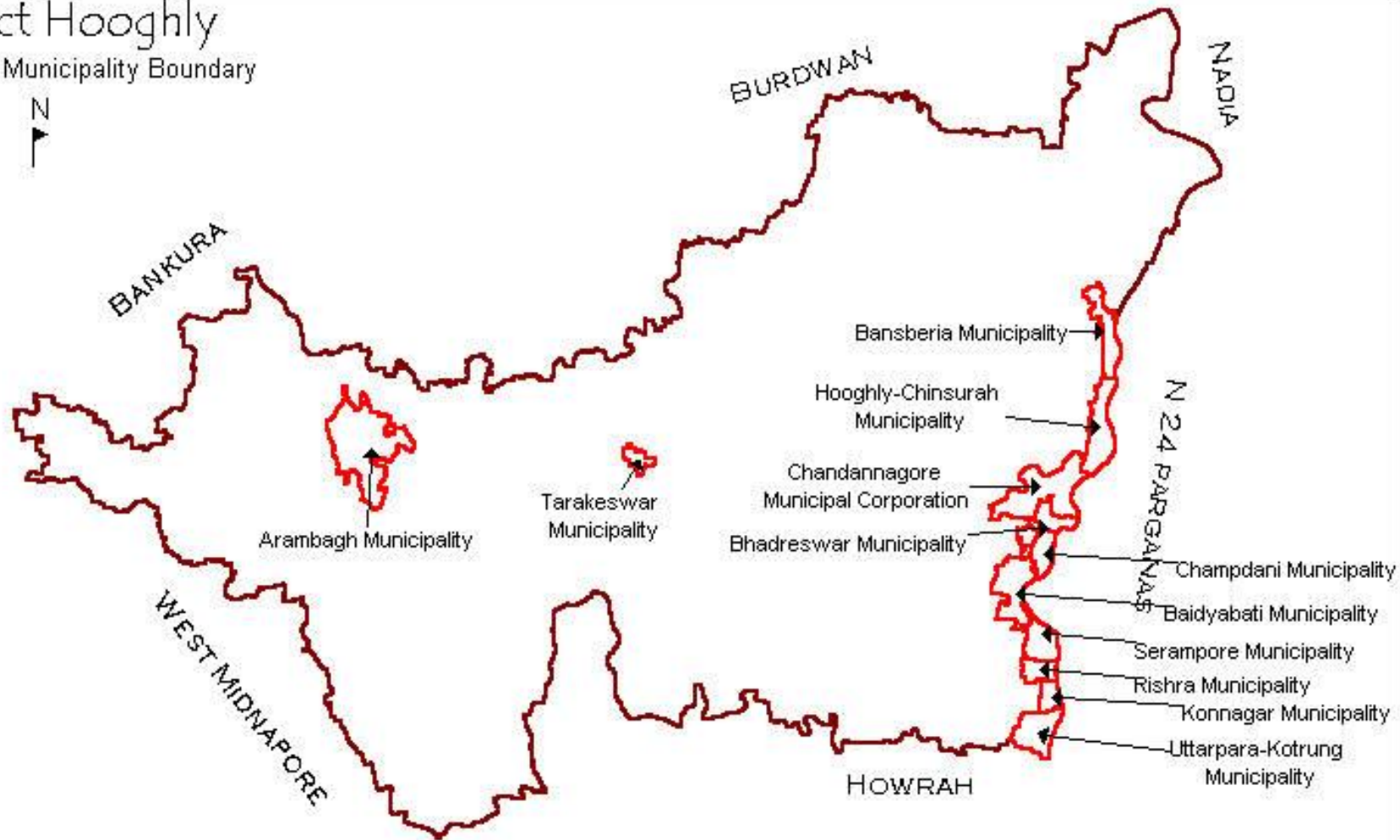
Retrofitted cycle rickshaw – battery + mechanical



STUDY AREA









District Hooghly

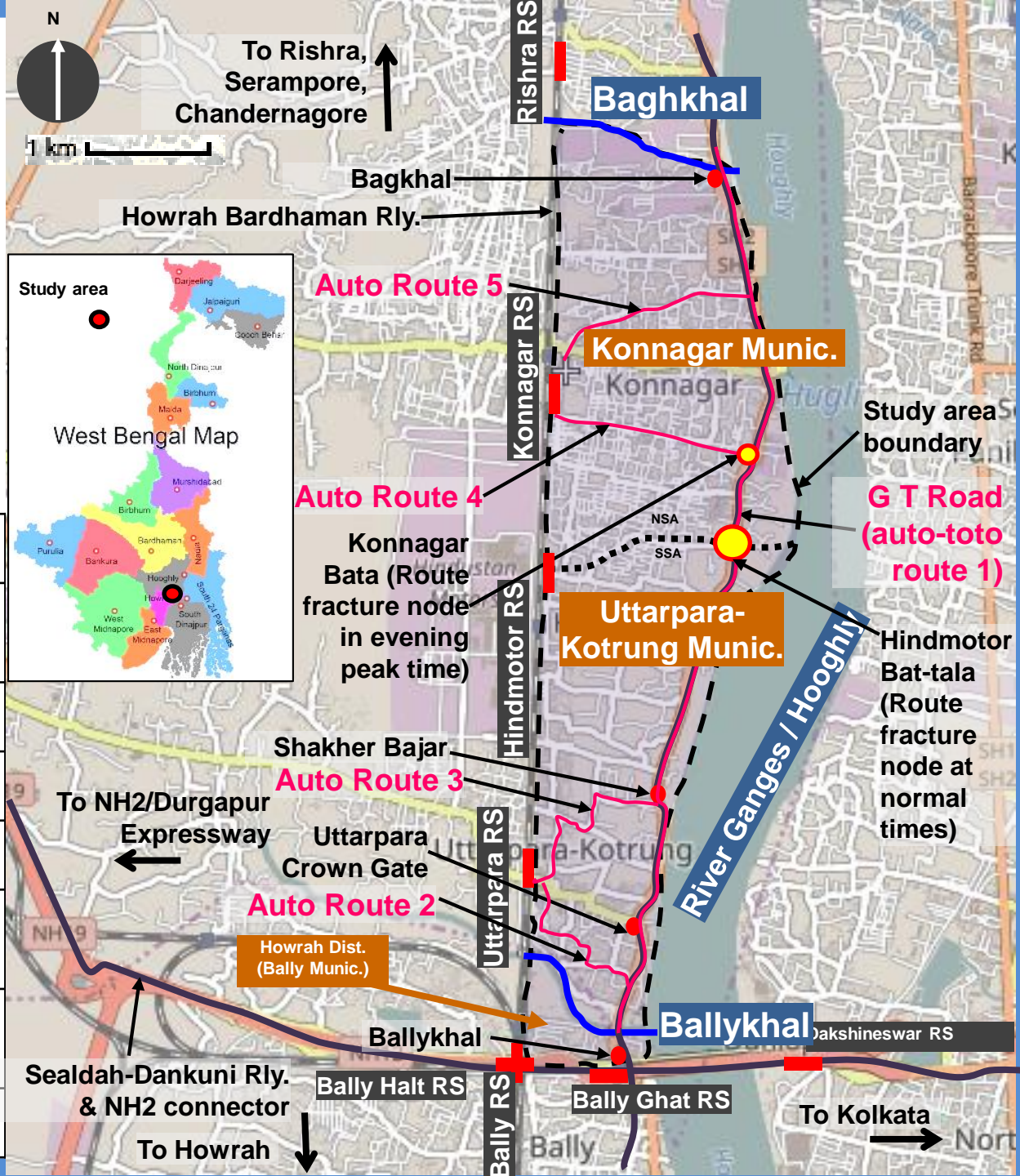
District and Municipality Boundary



STUDY AREA

- Uttarpara Kotrung Municipality, wards 1 through 19
- Konnagar Municipality-Konnagar
- Total area : 12 sqkm approx.
- Population : 2 lacs approx.
- Density : 16500 p/sqkm

	Study area boundary
	Division line between NSA and SSA
	Major road in and around SA
	Auto route
	Canals
	Railway station aligned with rail line
	Stops other than route fracture point
	Fracture point on route



Municipalities →		Uttarpara-Kotrung Munic. (UKM)	UKM study area (wards 1 through 19)	Konnagar Munic.	Total (UKM & KM)
Established in		Year 1835		1865 / 1944 ¹	
Area (sqkm)		16.34	7.6 (c. 47% of UKM)	4.32	20.66 (11.92 in Study area)
Popn.	2001	1,50,204	-	72,211	222415
	2011	1,59,147	1,19,473 (75 % of UKM)	76,172	235319 (195645 in study area)
	Increase	8,943 (5.90%)		3,961 (5.50%)	12,904 (5.8%)
Density (p/sq km)	2001	9,192	-	16716	-
	2011	9,740	c. 15500	17632	(16413 in study area)
	Increase	548 (5.96%)		916 (5.47%)	-

¹Part of a municipality since 1865, Became separate municipality in 1944

Municipalities →		Kolkata MC	Howrah MC	Bally Munic.	Dankuni Munic.
Established in		1876	1862 (Howrah Municipality) 1984 (corp.)		2008
Area (sqkm)		185	51.74	11.81	19.50
Population	2011	4,496,694	1,077,075	113,377	94,936
Density (person/sqm)	2011	24,306	20,817	9,600	4,868

Major stoppages (among 34) along G T Road and their attractions

Sl. no.	Stoppage name	Distance from Ballykhal (km)	Attractions
1	Ballykhal terminus (under railway bridge)	0	<ul style="list-style-type: none"> ❖ Spacious and organised terminus for auto and toto both ❖ Passengers from and to Ballykhal Bus stop and Ballyghat RS
8	Crown Gate	1.175	<ul style="list-style-type: none"> ❖ Uttarpara station 1km away (by rickshaw or on foot) ❖ Fish market ❖ Commercial centre
13	Shakher Bajar	2.38	<ul style="list-style-type: none"> ❖ Mahamaya Hospital ❖ Commercial centre ❖ Auto to Uttarpara station
27	Konnagar Bata	5.7	<ul style="list-style-type: none"> ❖ As per demand, this is actual terminus but no parking space. Closest parking is at Bagkhal. ❖ Auto route to Konnagar railway station ❖ Access to ferry stop (to Panihati ferry stop across river and eventually connected to Sodepur) ❖ Beyond this, maximum number of trips are to and from Rishra & Serampore
34	Bagkhal	7.4	<ul style="list-style-type: none"> ❖ Toto and auto terminus for Rishra and Serampore. ❖ 90% of the trip to Serampur.



Ballykhal – toto waiting on road



Ballykhal - Toto stand



Ballykhal Auto and Bus stand



Ballykhal – towards Howrah



Konnagar Bata – totos hooking passengers alighting ferry



Konnagar Bata – from north



Konnagar Bata – Auto stand (to station)



Konnagar Bata – toto “stand” – nearer to the junction



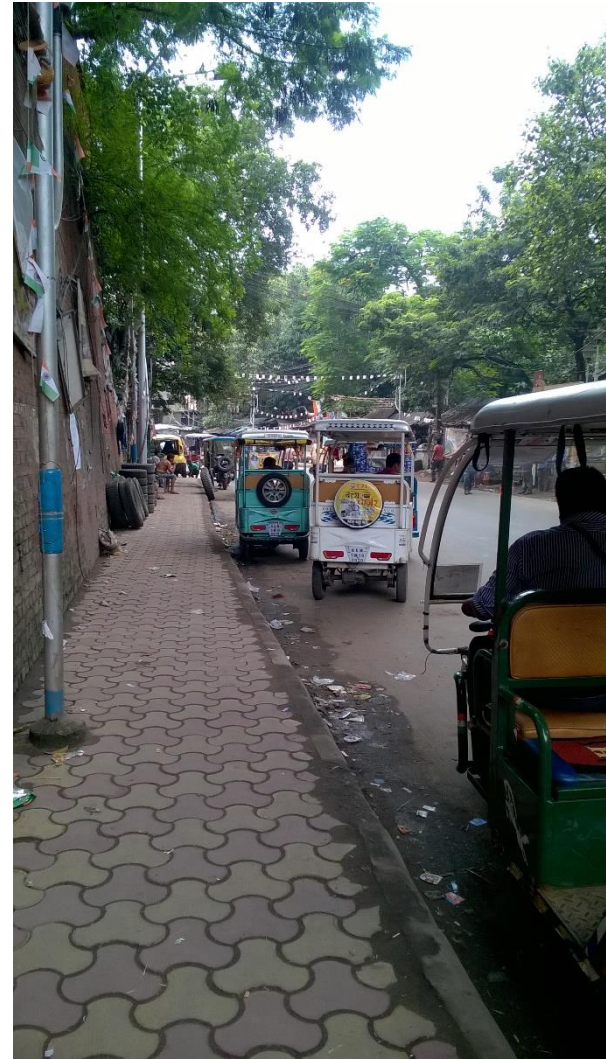
Konnagar Bata – road to ferry-ghat



Evening queue for auto : Ballykhal-Bagkhal



**Ballykhal toto stand
- queue for toto**



**Ballykhal toto stand
- queue for passenger**

Regional connectivity

- Ballykhal and Ballyghat : collection point
- 23 buses (approximately 15 introduced after 2014)
- Auto and totos to Howrah and Dunlop
- Trains from Ballyghat
- Trains from Bally-halt & Bally [not on toto-route]
- Ferry services to Kolkata Metropolitan Area
 - Konnagar-Panihati : for Sodepur
 - Uttarpara-Ariadaha : for Dakshineswar, Dumdum, N-24 parganas



Local connectivity

- 5 nos. auto routes and 136 auto rickshaws (all licensed)
- About 10 rickshaw stands
- 2 toto “stands” and one toto “route” (self regulated)
- One bus (Ballykhal to Makla)
- One auto route each : Ballykhal-Dunlop, Ballykhal-Salkia, Konnagar-Serampore





METHODOLOGY : PRECEDING WORK

EVOLUTION OF STUDY TOPICS IN THE FIELD OF INFORMAL TRANSPORT

Before 1995

- ❖ Localised and exploratory studies to document “novel” modes and systems
- ❖ Focused on urban transit in general rather than informal transit

1995 - 2000

- ❖ Compilation of local studies
- ❖ Local studies isolating informal transportation as subject
- ❖ Specialisation of topics

2005 - present

- ❖ formalisation process,
- ❖ vehicle and service design and modification, fuel efficiency
- ❖ **service quality attributes & user perception**
- ❖ environmental impact
- ❖ Integration attempt with arterial system
- ❖ Occupational hazards and driver’s quality of life



TOPICS OF STUDIES & GEOGRAPHICAL LOCATION

1. **Transport in developing / low and medium income nations**
2. **Physical and operational characters : South-East Asia, India**
3. **Environmental impact, pollution : South-East Asia, Nepal, India, Africa**
4. **Accident and safety issues : Africa**
5. **Study and Improvement of vehicle design for better ergonomics and fuel efficiency : South East Asia,**
6. **Formalisation attempt : South Africa**



TOPICS OF STUDIES & GEOGRAPHICAL LOCATION

7. Integration i.e. Possible role as feeder service to existing line-haul or upcoming rapid transport : South East Asia, India, Latin America.
8. Occupational hazard, employment, quality of life of drivers : India, Africa, South East Asia, Sri Lanka
- 9. User perception of various attributes of the mode and services : South East Asia, India, Bangladesh, Pakistan,**
10. Character of and response towards new, battery operated mode : India, Bangladesh



EVOLUTION OF METHODOLOGY

Literature on user perception and service quality attributes of paratransit / informal transit and respective number of factors and attributes [table 4]

Symbol in col (iii), table 5.	Reference	Factors / classes	Attributes / indicators
i	ii	iii	iv
A	Joewono and Kubota, 2008	8	43
B	Sumaedi et. al., 2011	5	20
C	Rahman et. al., 2016, 2017	nil	21
D	Torres and Gutiérrez, 2014	3	14
E	Javid et. al., 2013	3	13
F	Rana et. al., 2013	8	nil
	Total	27	113

INFERENCE FROM THE PRECEDING STUDIES

- **Attributes and indicators were re-worded and coalesced from the 27 factors & classes and 113 attributes / indicators in table 4 & roughly grouped without any hierarchical order by authors**
- **The result was a list of 52 attributes that could be classified under 9 classes.**



WHY NOT USE THE SAME ATTRIBUTES AND TOOLS ?

PRECEDING STUDIES ARE...

- From a developed stage of years of research
- Applicable to long-established modes and operational practices
- Quantitative
- They study one [predominant] mode, and not the entire choice set.
- Located in the principal city of the region.



HOW IS THE PRESENT CASE DIFFERENT FROM THE PRECEDING ONES ?

- **Few studies on the informal transportation in study area**
- **Study area and the current times are going through a major change due to introduction of new mode**
- **No single mode provides exclusive service.**
- **Not the largest / most important city in the region**



WE NEEDED TO START FROM SCRATCH

- Requirement of a pilot study to sensitise passengers, capture their feelings to identify attributes of the SCFS and SCFM
- Discussion-based study that can link people's perception to tangible characters of the mode and service as stated by them as well as those observed by the researcher.





As a result...

METHODOLOGY : PRESENT WORK

General format

- **Qualitative study**
- **The physical and operational characters were reconnoitred by FGDs of users and operators of all the four modes.**
- **Semi structured questionnaire interviews and FGDs were used for users and potential users of feeder services.**
- **The first stage questions were with reference to tofos and based on the nature of responses were re-formulated at the second stage to encompass all the four feeder modes**



OBJECTIVES

To understand the...

1. ...awareness, advantages, disadvantages and areas of improvement of the SCFS and SCFM as perceived by passengers.
2. ...indicators related to the entire feeder mode choice-set (ref sub-section 1.2.2 in paper) as perceived and stated by passengers and potential.



Data sources

- **Secondary data – census, Arora et. al. 2016, municipalities, record at modal association offices**
- **Reconnaissance over the years**
- **Operators of bus, auto, toto, cycle-rickshaw**
- **Passengers within the study area**
- **Discussions with**



SURVEY STAGES :

(a) Reconnaissance since 2012:

- Reconnaissance of passengers and modes.
- Discussion with passengers and operators of various modes
- Vehicle counts at major nodes (2016, 2017)

Use of the study

The impetus for this paper



SURVEY STAGES

(b) Discussion with operators

- **Personal interviews and FGDs (2016, 2017)**

Use of the study

- **To corroborate and reinforce the data from reconnaissance study**
- **To prepare of the second stage questionnaire for user study and cross-checking the finds thereof**



SURVEY STAGES

(c) Study of users and potential users :

Stage 1 of study no. (c) – on users and operators

- Queries
 - Awareness and consciousness about services and service quality of the transit and feeder services available to them.
 - Dependence on paratransit,
 - The general experience and attitude of people towards SCFS ad SCFM over last three years.



SURVEY STAGES

(c) Study of users and potential users :

Stage 1 of study no. (c) – on users and operators

- Inference
 - It was found that certain attributes of toto set it apart from the other two SCFS and SCFM in view of passengers .
 - It was evident that passengers always weigh their options between toto, auto and rickshaw and the scarce bus.
 - Passengers and operators both, while answering questions directed clearly and exclusively on totos, continued to compare their experience of auto and rickshaw and even buses



SURVEY STAGES

(c) Study of users and potential users :

Stage 2 of study no (c) of only users

- Queries
 - A more detailed questionnaire concerning experience of all the four modes
 - The seemingly repetitive and reiterated questions were meant to cross-check and corroborate the answers without having to lead the respondent to it and to work as a proxy to the studied ways of user perception surveys
 - **Queries divided in five groups**





RESULTS

ANSWERS CATEGORISED

- i. Users' definition of qualitative terms in relation to paratransit service, large or small**
- ii. Reason for using paratransit**
- iii. Travel conditions and mode choice**
- iv. Advantages and disadvantages of different SCFS and SCFM**



i. Users' definition of qualitative terms in relation to paratransit service, large or small

The common indicators for perceptions of convenience, comfort, reliability/dependability, safety and customer service are...

- availability at odd hours,**
- safe and comfortable driving,**
- earlier incidents of mishaps,**
- feeling assured that a mode will definitely arrive soon (and not the waiting time *par se*),**
- fixed fare**
- Prevalent in NSA residents. They prefer to wait in auto queue for 30 minutes and be assured of not being refused by the driver than to be refused an unpredictable number of times by totos. These people are loyal to auto**



i. Users' definition of qualitative terms in relation to paratransit service, large or small

The factors that were used to define a perception by 90-100% of the respondents are as below:

- Availability at odd hours, easy availability (waiting time < 5 minutes), feeling assured that a mode will definitely arrive soon (and not the waiting time *par se*) for convenience and reliability.**
- Safe and comfortable driving, earlier incidents of mishaps, less jerking, reasonable speed for comfort and / or safety.**
- Ease of boarding and alighting for comfort.**



ii. Reason for using paratransit

- frequently available,
- no personal vehicle,
- closer to doorstep,
- many options faster (only toto and auto),
- no personal car



iii. Travel conditions and mode choice

- **Auto-rickshaws are by far the preferred mode for shorter trips along the length of SA, due to both speed and physical comfort.**
- **Totos are considered safer (or comfortable) due to their lower speed since passengers tend to attribute road accidents to high speed almost solely and not to driving quality or vehicle design**



iv. Advantages and disadvantages of different SCFS and SCFM

- the advantages of totos are that of service whereas the advantage of the other modes are in vehicle design**
- Cycle rickshaws lose out in time and cost both.**
- Buses are the victim of a vicious cycle : lesser profit leading to reduced fleet size leading to lost passengers leading to lesser profit.**





INFERENCE

Totos are “alternatives”

- Toto as a mode is not the first preference of passengers but an alternative to the preferred but rarely available modes of auto-rickshaw or an even rarer mode of bus.
- Totos, in addition to providing mobility and in spite of the limitations on speed and comfort, offer all the soft services that autos cannot or do not offer.
- It is possible as there is no regulation affecting the numbers and operations of totos^{Note 1} but totos compete among themselves too.
- Battery operated cycle rickshaws will change the scenario further.

Note 1 : Since June 2017, regulation on totos are being implemented in various manners



WAY FORWARD

Inference

- **Totos and autos compete on unequal grounds**
- **Totos when regulated may not be in a position of advantage**
- **However, operating unregulated and for individual profit, they expose the lacunae in existing system**
- **The benefits of totos will help in optimising the vehicle and policy design.**
- **Physical and operating characters of totos need to be studied urgently.**





THANK YOU