

RESEARCH QUESTIONS

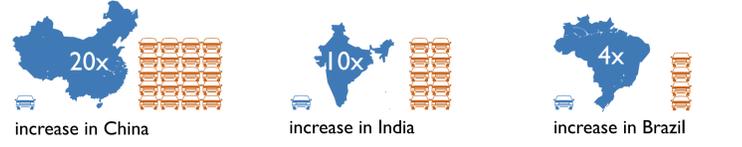
- How are the objectives and priorities of Janmarg BRTS decided?
- What is the level of citizen participation in the planning of Janmarg BRTS?
- How do stakeholders and planners interact and what are the consequences in achieving goals?
- What is the social impact of Janmarg BRTS on marginalized groups?
- Is Janmarg BRTS successful and can it be replicated in other regions?

1. TRANSPORTATION ISSUES IN DEVELOPING COUNTRIES

WITH RAPID ECONOMIC GROWTH COMES...



There will be a **five-fold** increase in the total vehicle fleet in non-OECD countries from 2002–2030; **two billion** vehicles in total!



...THE CONSEQUENCES?



Road traffic accidents are the **third-most leading cause of death** and disability in developing countries².

2. BUS RAPID TRANSIT SYSTEMS (BRTS): A POTENTIAL SOLUTION



WHAT IS BRTS?
 BRTS is a bus-based integrated system of stations, bus lanes, services, and intelligent transportation technologies.

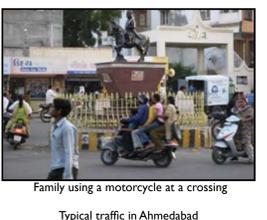
WHY BRTS?

It is one of the most cost-effective options to provide high-capacity public transit³.

Characteristic ⁴	BRTS	Light-Rail	Heavy-Rail
Carrying Capacity (at peak hour)	2000–10000	3000–18000	13000–41000
Capital Costs (per unit distance)	\$	\$\$\$	\$\$\$\$\$
Operating Costs (per vehicle revenue unit distance)	\$	\$\$	\$\$\$
Minimum Density Needed (dwellings per acre)	9	9	12

BRTS is an attractive option for many cities because it can be implemented **immediately** with **high network coverage** at a **low cost**.

3. TRANSPORT IN INDIA: MORE MOTORBIKES, LESS BUSES



The motor vehicle fleet has been **doubling every four years** the last three decades⁵.

Many Indian cities are experiencing a cycle of **decreasing bus ridership** and **reduced transit services**⁵.

In response, many transit users have switched to cheap **two-wheeled motor vehicles**⁶.

Statistics: 1995 to 2005⁷



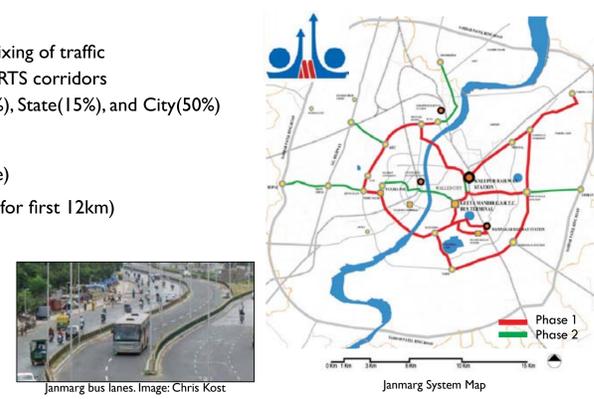
4. JANMARG: "BEST PRACTICE" BRTS IN SOUTH ASIA

FEATURES AND NUMBERS:

Median stations and bus lanes with little inter-mixing of traffic
 Road widenings (right of ways: 30–60m) along BRTS corridors
 Funded by the JNN Urban Renewal Mission (35%), State (15%), and City (50%)

- 51,200 riders daily (and increasing)
- 58km of bus lanes for Phase 1 (half complete)
- \$245M US: total cost of Phase 1 (\$125M for first 12km)
- 30km of bus lanes for Phase 2 (in planning)
- \$87.5M US: total cost of Phase 2
- 75 bus stations total (after completion)

In contrast, Pune and Delhi BRTS received negative press and little public support



5. METHODOLOGY

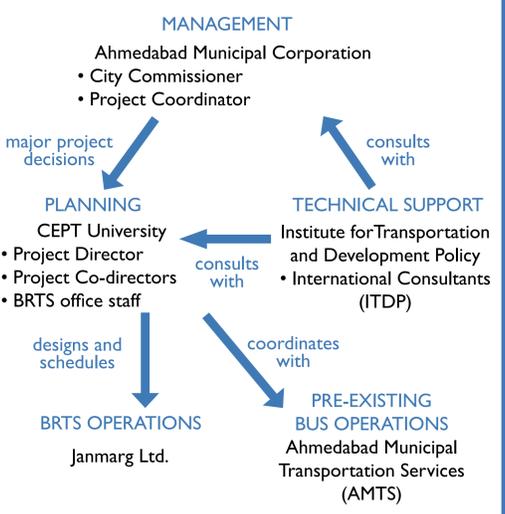
On site May 24 to July 27, 2010
 42 recorded interviews:
 28 individual
 14 group discussions

Interviewees:
 • Project directors and public officials
 • Project staff and support
 • Business owners and community organizations
 • Transit users and citizens



- Other evidence:
 • Reports
 • Documents
 • Records
 • Public data
 • Press releases
 • Direct observation

6. DECISION MODEL



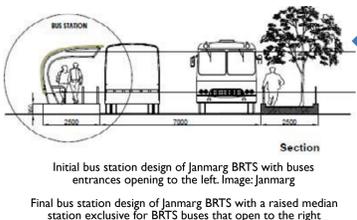
7. PUBLIC PARTICIPATION: WHICH PUBLIC AND HOW?

- MEDIA**
- Close media attention to BRTS
 - Regular press releases by the city
 - BRTS branding and hype among citizens
- OPENNESS**
- Commissioner's office open to inquiries, concerns, questions via phone or e-mail
- PUBLIC EVENTS**
- Workshops for experts, international community and public officials
 - Open displays at CEPT University and other venues
- DEMONSTRATION**
- Prototype bus station
 - 12km demonstration corridor
 - Free transit first month of operation
- City and CEPT University took visitor comments and feedback; also helpful for user education

LEVEL OF CITIZEN PARTICIPATION⁸:



8. HOW JANMARG'S DESIGN EVOLVED FROM INTERACTIONS



← CEPT University's initial BRTS station design "Pune and Delhi BRTS model"

ITDP advised a design change but CEPT did not respond immediately

- Proposed raised median stations to exclude competing and inadequate buses that caused problems in Pune and Delhi BRTS
- Need for better bicycle and walking infrastructures

← ITDP flew decision makers to Bogota to explore ideas and convince them to make the design change

- Project coordinator decided to change design immediately upon return on-site, mid-construction
- Subsequent trips were made by CEPT and BRTS project directors
- Unfortunately, bike and pedestrian infrastructures were not taken seriously

9. SOCIAL IMPACTS: THE GOOD AND THE BAD



IMPROVED ACCESSIBILITY
 BRTS user: "[BRTS] helps people go from RTO to Maninagar... half an hour. That's very fast because the AMTS takes [me] one hour"
 BRTS user: "AMTS cannot guarantee when it comes, but BRTS comes every five minutes at least"
 Grade student: "Cycle... takes an effort. Here, you can just sit in the bus stop and [you] can reach it."

SLUM CLEARANCE
 Impacted business owner: "Now [my] shop has been destroyed so it has become much smaller now and [I] cannot keep as much stuff... so it has affected [my] shopkeeping."
 "BERLIN WALL" EFFECT
 Impacted resident: "It is very dangerous to cross the roads, it is so fast. You cannot cross the road as smoothly as you used to."



CHEAP FARES
 BRTS user: "... it is one rupee more than AMTS but it is getting us on time. So it is fine if you pay a little more money... very good time to time service..."

Impacted resident: "The children could go to school and the children could go to any shop and anywhere free because there was no barrier..."



HIGH SAFETY
 BRTS user: "[BRTS] have a separate bus stop. On the AMTS, [I] have to stand on the road... there have been a lot of close chance of [getting injured]."
 Grade student: "Riding a cycle, there is a chance of accidents. Where there is no question of accidents in a separate route for a BRTS."
 Pedestrian: "after the BRTS, you have the well-maintained footpaths... so people can walk over there nicely and the traffic has been pretty smooth... safety has definitely improved."

HAWKER DISPLACEMENT
 Hawker: "... encroachment people operations will come and they demand to vacate this [BRTS] space... it is not a consistent type of evacuation."
RELOCATION
 Relocated slum resident: "[We] were vendors... now waste picking... don't have anything to vend. There's no market here."



10. PROJECT EVALUATION

- FINANCIAL**
- Operation costs **recovered** by fares
 - Maintenance costs are still an issue
 - Potential for revenues from advertising space
 - Are **flyovers necessary?** They are considerable costs to the project
 - Buses do not even use the flyovers
- ENVIRONMENTAL**
- Modal switch detected (34% of BRTS riders used cars, motorbikes or rickshaws before Janmarg)
 - Reduced traffic (esp. Sunday nights)
- TRANSPORTATION**
- Safer, faster and more reliable than AMTS
 - Cheap fares (Rs. 2–16) but the average monthly expenditure on transport is Rs. 103
 - Flyovers used for project encourage fast driving and unfriendly pedestrian environments
 - System does not address the majority of trips that go to the center of the city
 - Pedestrian and bike infrastructure present but **inadequately designed:** 55% of the city bikes or walks
 - Bike lanes and sidewalks can be too narrow
 - Motorcyclists use bike lanes as service lanes
 - Cars/hawkers park on sidewalks and bike lanes
 - Infrastructure located only along corridor



11. LESSONS LEARNT

- Janmarg has greatly improved public transit and should be taken with pride by local Indians
- Tells the rest of India that BRTS can work despite previous shortcomings in Pune and Delhi
- Goals and objectives need to properly defined to evaluate planning decisions
- BRTS should not be the end of its own means
- Planning should not be treated as a "project" but rather a "process"
- Lack of proper objectives in Janmarg resulted in too much attention to trivial details like flyovers and neglect on bike and sidewalk infrastructures
- Research and explore case studies before tackling planning problems
- Janmarg would have had the same shortcomings seen in Pune and Delhi if ITDP was not there to provide technical support, international BRTS experience and information
- Lessons learnt from international examples can be adapted to the local context and culture
- Evaluate the social costs of planning decisions through proper impact assessments
- Setting up market spaces beside stations could have helped mitigate impacts of hawker displacement
- Fair compensation needed for impacted communities or avoidance of slum clearance altogether
- Public participation needs to be engaging to all stakeholders including impacted communities
- Simply setting up a public event far from slum communities is not enough

ACKNOWLEDGEMENTS AND REFERENCES

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¹Dargy et al. (2007). Vehicle ownership and income growth, worldwide: 1960–2030. *The Energy Journal* 28(4): 163–190.
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⁴Zhang (2009). Bus versus rail: meta-analysis of cost characteristics, carrying capacities, and land use impacts. *Transportation Research Record* 2110: 87–95.
⁵Badami and Haider. (2007). An analysis of public bus transit performance in Indian cities. *Transportation Research Part A* 41: 961–981.
⁶Badami. (2005). Transport and urban air pollution in India. *Environmental Management* 36(2): 195–204.
⁷Ponnaluri and Santhi. (2009). Road crash history and risk groups in India: need for new initiatives and safety policies. *Transportation Research Record* 2114: 64–71.
⁸Arnstein. (1969). A ladder of citizen participation. *Journal of the American Planning Association* 35(4): 216–224.