



ASSESSMENT OF BUS TRANSPORTATION SYSTEMS OF KERALA: A CASE STUDY OF KOCHI

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NEED OF THE STUDY – RESEARCH IN A NUTSHELL

- Experimentation of various cities on combinations of bus transportation – for efficient service provision
- Kerala exhibits - existence of dual operators with different ownership and operators for service provision over years
- co-existence of dual operators in a socialist-centered state

AIM OF THE RESEARCH

To **assess** the various **bus transportation systems** in Kerala taking Kochi as a case

OBJECTIVES

- To analyse the role of policy framework and institutions in evolution of bus transportation systems in Kochi.
- To study the existing bus transportation systems and assess their functioning

STUDY AREA CHARACTERISTICS

- Planning area for Town and Country

42%

Public transport

Planning Organisation

Metro

Waterways

Bus

Metro

Urban bus transportation systems – Average trip length of Bus – defined within city limits – constituted within Kochi City Region

BUS SYSTEMS IN KOCHI

KOCHI CITY REGION

369.72 sqkm



6.46 lakhs



1,012 ppsqkm



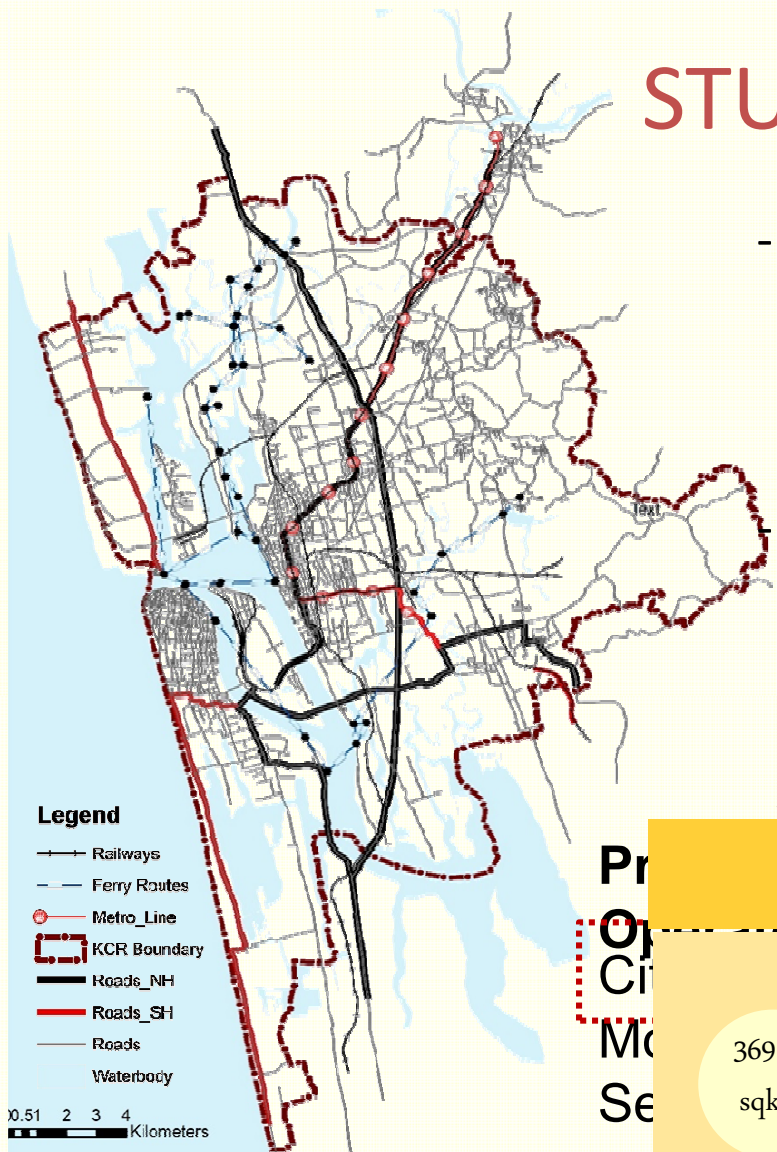
97.50%



Population size 12,79,000/da



05:30am - 11:00pm



INTRODUCTION TO BUS TRANSPORTATION- OPERATORS

	PRIVATE OPERATORS	KSRTC	KURTC
TIMELINE	1938	1946	2009
OWNERSHIP	Registered under Cooperative society	Travancore Cochin State Transport Dept.	Under the banners of KSRTC
OPERATION	Individual operators	State Transport Dept.	Kerala State Road Transport Corp.
MAINTENANCE	Individual operators	State Transport Dept.	Kerala State Road Transport Corp.
ORGANISATIONAL STRUCTURE	Abse	Abse	
YEAR	1970	1965	2014
ORGANISATIONAL STRUCTURE	Private Bus Operators Association President Vice President Secretary Member	Kerala State Road Transport Corporation Depot Sub Depots Terminals	Kerala Urban Road Transport Corporation Depot Sub Depots Terminals
YEAR	2017		
	SI Corporation, 1 Union and 5 LLP		

TIMELINE OF BUS TRANSPORTATION

	OWNERSHIP	OPERATIONS	MAINTENANCE AND REGULATION	IMPACT / INFLUENCE
OPERATORS	<p>Private Operators</p> <ul style="list-style-type: none"> - Single ownership - Partnership based ownership <p>State run operators</p> <ul style="list-style-type: none"> - KSRTC Operators - KURTC Operators 	<p>Demand driven approach</p>	<p>Private Operators</p> <ul style="list-style-type: none"> Fleet maintenance and upkeep <p>State run operators</p> <ul style="list-style-type: none"> Fleet maintenance and upkeep 	<ul style="list-style-type: none"> - Changes in fleet size - Levels of ridership - Profitable routes of operation- more services - Uncontrolled growth of fleet and ridership
AUTHORITIES	<p>Local Level (Private operators)</p> <p>PBOA PBO KBTA PBF</p> <p>State Level</p> <p>RTO KSRTC KURTC</p>	<p>R.T.O</p> <ul style="list-style-type: none"> -Route formulation -Operational timings -Permit issuance and renewal <p>P.B.O.A</p> <ul style="list-style-type: none"> -Fleet registration -Meetings etc. to ensure proper conduct of service 	<p>R.T.O</p> <ul style="list-style-type: none"> -Route formulation -Operational timings -Permit issuance and renewal <p>P.B.O.A</p> <ul style="list-style-type: none"> -Fleet registration -Meetings etc. to ensure proper conduct of service <p>Police Dept.</p> <ul style="list-style-type: none"> -Accident Regulation 	<ul style="list-style-type: none"> - Introduction of new services due to policies - Restriction in service due to implementation of policy - Provision through limitation of permits
ACTS/POLICIES /SCMES	<p>Extent of reach</p> <ul style="list-style-type: none"> - National Level - State Level - Local level 	<ul style="list-style-type: none"> - Nationalisation Policy - Liberalization Policy - Students' concession scheme - Fare revision policy and schemes - Network changes 	<p>Nationalization</p> <p>Complete exclusion scheme or partial exclusion</p> <p>Fare regulation:</p> <p>PISCO fare setting; State Government</p>	<ul style="list-style-type: none"> - Change in fleet size - Change in nw coverage - Change in operntl area - Change in ridership - Route deviation
PERFORMANCE	<p>Private Operators</p> <ul style="list-style-type: none"> - Greater availability of fleet <p>State run operators</p> <ul style="list-style-type: none"> - KSRTC Operators - KURTC Operators 	<p>Private Operators</p> <ul style="list-style-type: none"> -Higher operational efficiency -Better coverage <p>State run operators</p> <ul style="list-style-type: none"> -Better timings 	<p>Private Operators</p> <ul style="list-style-type: none"> - Better maintenance of fleet - Lower age of vehicles - Higher rate of accidents <p>State run operators</p> <ul style="list-style-type: none"> - Better operational timings 	<ul style="list-style-type: none"> - Stoppage of services operators - High levels of competition - Variation in fleet



TIMELINE OF BUS TRANSPORTATION

	OWNERSHIP	OPERATIONS	MAINTENANCE AND REGULATION	IMPACT / INFLUENCE
OPERATORS				
AUTHORITIES				
ACTS/POLICIES / SCHEMES	NATIONAL LEVEL STATE LEVEL LOCAL LEVEL			
PERFORMANCE				

ASPECTS OF BUS ASSESSMENT

National Level Changes

Nationalisation

Liberalisation Policy

State Level Changes

Fare Revision

Local level changes

SPATIAL CHANGES

- Change in area of jurisdiction
- Change in networks enhanced connectivity

POLICY CHANGE

- Change in definition of city and mofussil areas

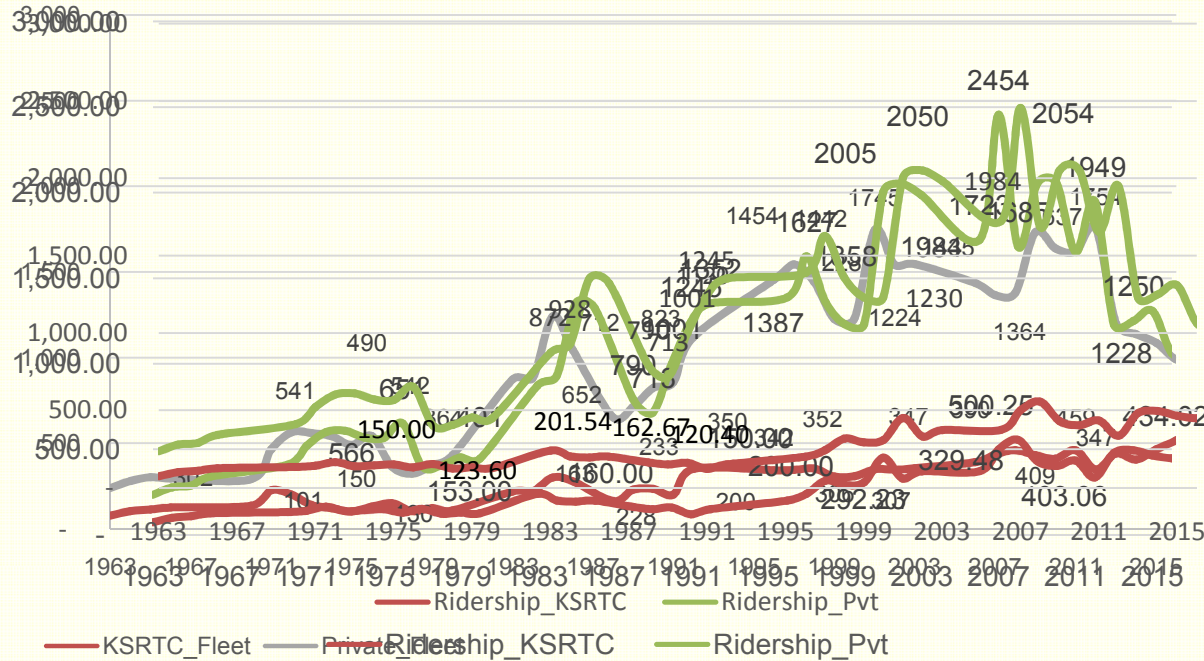
STATE LEVEL CHANGE WITH LOCAL LEVEL IMPACT

- Permit cap
- Permit withdrawal

FLEET SIZE AND RIDERSHIP VARIATIONS

ASSESSING VARIATION IN FLEET AND RIDERSHIP – STATE LEVEL

Variation in fleet size



1. Not aligned with respect to liberalisation of private operators fleet sizes
2. Private operators fleet sizes
3. Private operators fleet sizes

		CHANGE IN POLICY / ACT / SCHEME						
		KSRTC			PRIVATE			
LIBERALISATION & NATIONALISATION	Year	Before	After	Change	Before	After	Change	CHANGE IN FLEET SIZE
	1991	233	345	48.04%	856	1544	80.37%	
FARE REVISION	1991	160	150	-6.25%	1001	1352	3.50%	

OVERALL ANALYSIS

Nationalisation

Little impact on fleet size

Liberalisation

Opened up market for private operators

Fare changes

Variation in inelastic nature

What is the rationale behind the cap fixed for issuing permits?

Local level changes

Largely impacted on fleet size and ridership

Permit cap and permit withdrawal

Undersupply of fleet – KSRTC unable to make up

Unserved areas

Forcing users to use personalized modes

Though there had been measures to bring monopoly to KSRTC, it has been private operators who came up in the service provision

PERFORMANCE ASSESSMENT OF BUS SERVICES

SUPPLY

DEMAND

CAPACITY
 Infrastructure
 Bus stop/
 shelter
 Bus
 infrastructure

SERVICEABILITY
 Service provision
 Transit supply
 Route
 characteristic
 s

SAFETY
 Accidents
 Fatal
 Serious
 Vehicle
 Condition

PRODUCTIVITY
 Operational

Revenue

characteristics Revenue receipts

Ridership
 Mode share
 Details

Trip
 Average trip
 length
 Travel pattern
 Trip
 purpose
 User

Travel
 Availability
 Last mile
 connectivity
 Travel time
 taken

Comfort
 Reliability of
 service
 Willingness to
 pay

Private
 Operators

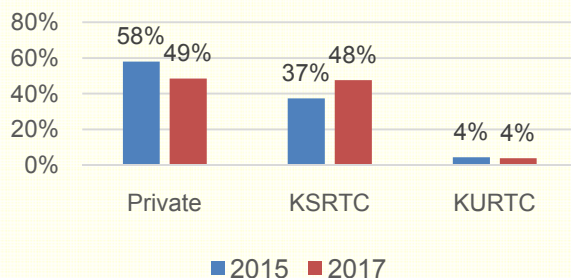
receipts KSRTC
 Operators

KURTC
 Operators

CAPACITY

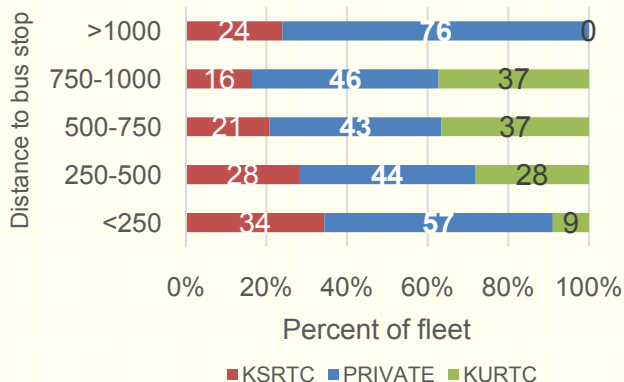
FLEET SIZES

Fleet size variation



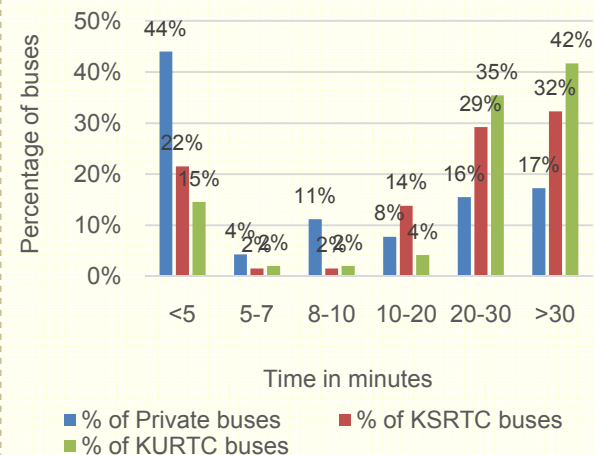
AVAILABILITY OF BUSES

Distance to the nearest bus stop vs mode arrived



HEADWAY OF BUSES

Percentage of buses vs headway



PRIVATE BUSES – GREATER AVAILABILITY, LESSER HEADWAY

size of private operators by 9% (106 private buses along feeder areas are available at headway >30 minutes)

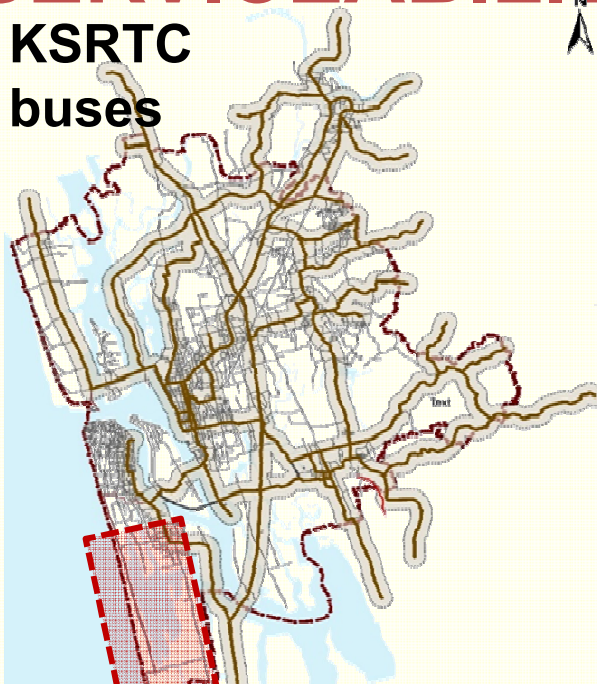


SERVICEABILITY

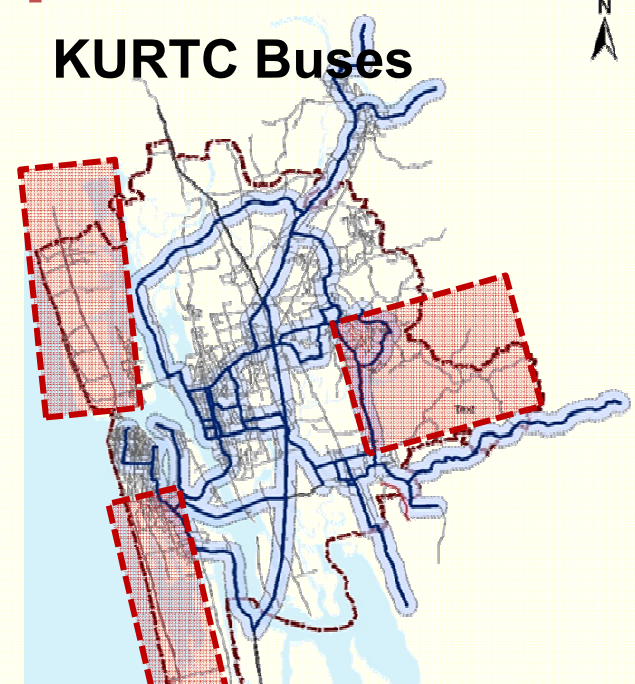
Private Bus Services



KSRTC buses



KURTC Buses



PRIVATE BUSES – GREATER COVERAGE

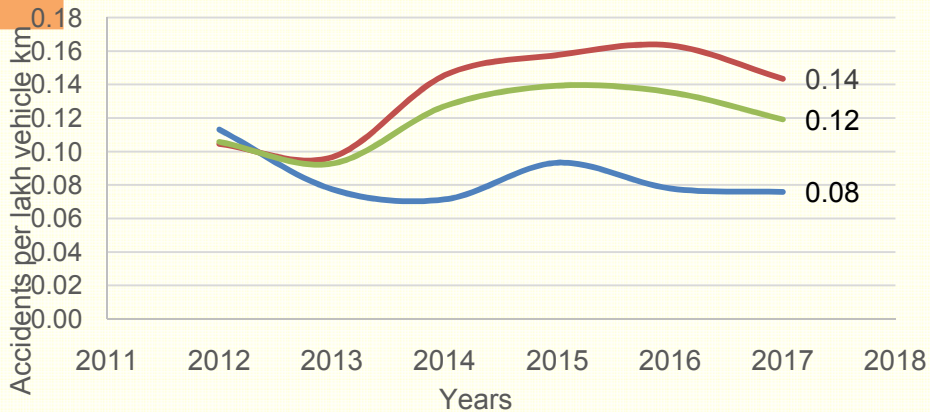
Overlapping of services along same transit corridor

Trunk corridors— availability of KSRTC, KURTC and private buses
Hinterland subserved

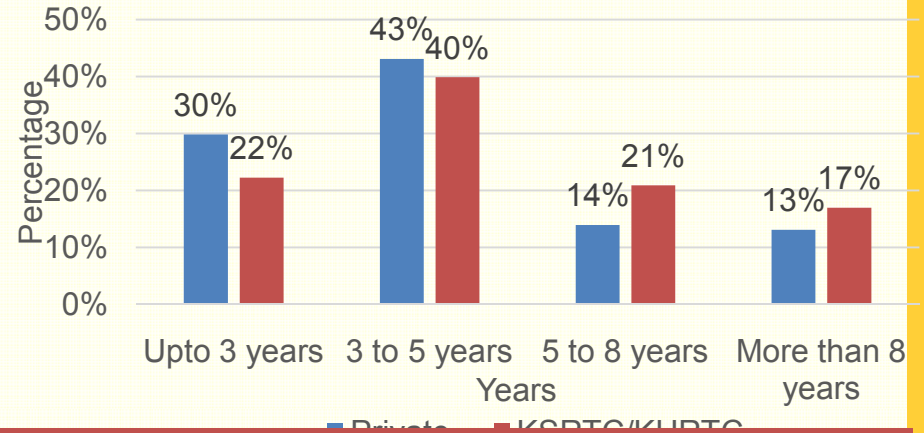
Least number of routes – KURTC; Low ridership due to less network coverage

SAFETY

Accidents per lakh vehicle kilometer



Average age of vehicles



HIGHER ACCIDENTS CAUSED BY PRIVATE OPERATORS - SAFETY ASPECT IN PRIVATE BUSES

on either STU buses or on other modes

5.9 years

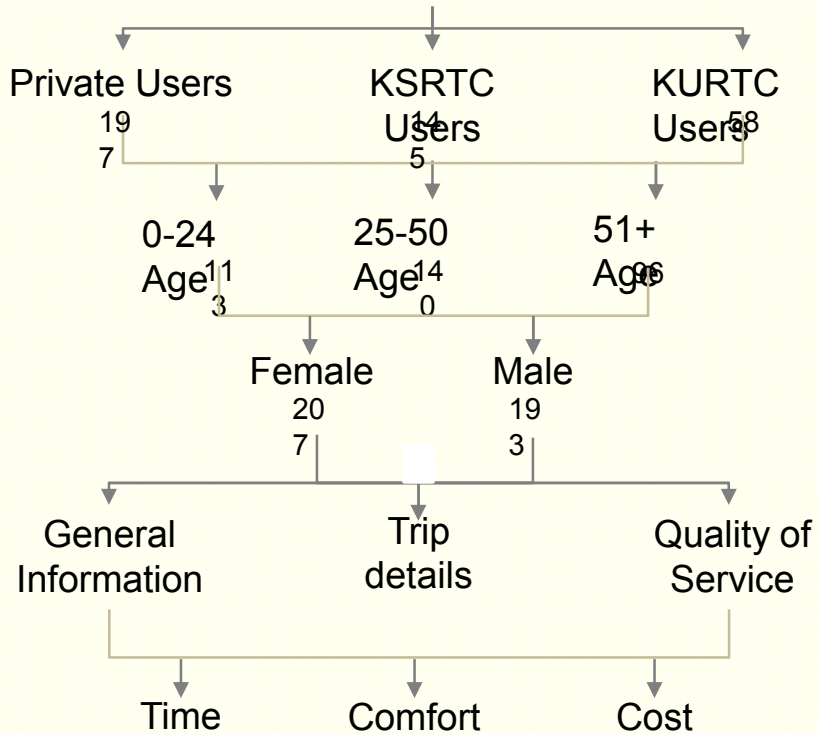
PERFORMANCE ASSESSMENT

Parameter	Indicator	Variable	Private	KSRTC	KURTC
Operating cost		EPB (Rs)	12,854	10,569	12,579
		CPKM (Rs)	37	85	69
		Average operational KM per day	285	265	278
		EPKM (Rs)	45.1	34.3	45.2
		Daily average operated KM per route of entire fleet	1867.9km	750.52km	325.46km
Maintenance		Fuel expense (Rs)	5,500	6,074	7,965
Traffic revenue		Tax and insurance revenue generated per day	274/day	Nil	Nil
			77,50,962	11,41,452	6,03,792
		Total	9,295	9,665	11,556
Bus utilization		Average fleet utilization for KSRTC	92%	85%	91%

PRIVATE OPERATORS – BETTER OPERATIONAL EFFICIENCY

USER PERSPECTIVE ANALYSIS OF BUS TRANSPORTATION

QUALITATIVE ASSESSMENT OF BUS SERVICES



TIMES

- Availability of bus
- Wait. time- bus stop
- Average travel time

AGGREGATE

- Time
- Comfort

COMFORT

- Crowd experienced
- Safety
- Seat availability
- Better bus condition

DISAGGREGATE

- Age
- Gender
- Trip pattern

COST

- Minimum fare
- Fare vs quality

USER PERSPECTIVE ANALYSIS OF BUS TRANSPORTATION

COMFORT FACTOR

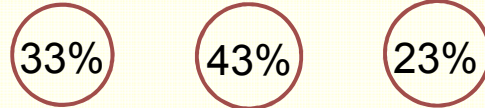
Crowd experienced



Private crowded KSRTC Crowded KURTC Crowded

Maximum crowd experienced – Private buses – lack of seat availability

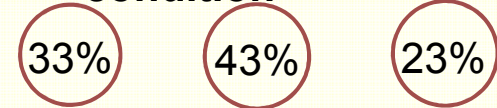
Safety experienced



Private crowded KSRTC Crowded KURTC Crowded

Higher rate of accidents for private buses

Better bus condition



Private crowded KSRTC Crowded KURTC Crowded

Average age of fleet - higher for KSRTC operators
Better condition of vehicles – private

KSRTC

PRIVATE

Better

Seat

sa

Lesser

crowd

Better

bus

condition



USER PERSPECTIVE ANALYSIS OF BUS TRANSPORTATION

PREFERENCE WITH TRIP PATTERN

PREFERENCE WITH TRIP PATTERN

Daily trip

Weekly trips

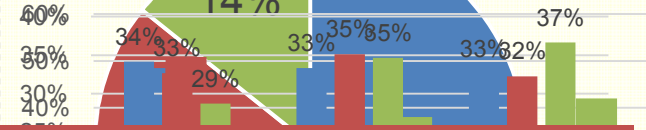
Occasional trips

Private buses – Most preferred for shorter travel

Private buses – greater availability, shorter travel time

KURTC – preferred mode for longer trips more

Frequency of trips made overall preferred mode



OVERALL SERVICE QUALITY RANKED HIGHER FOR KSRTC OPERATORS

service for the cost or fare paid

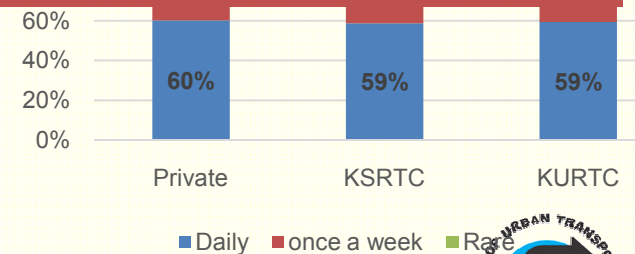
Better level of service for the fare paid

the fare paid

Overall service quality – ranked higher for Private buses

Overall service quality – ranked higher for KSRTC and Private buses

Overall service quality – ranked higher for KSRTC buses

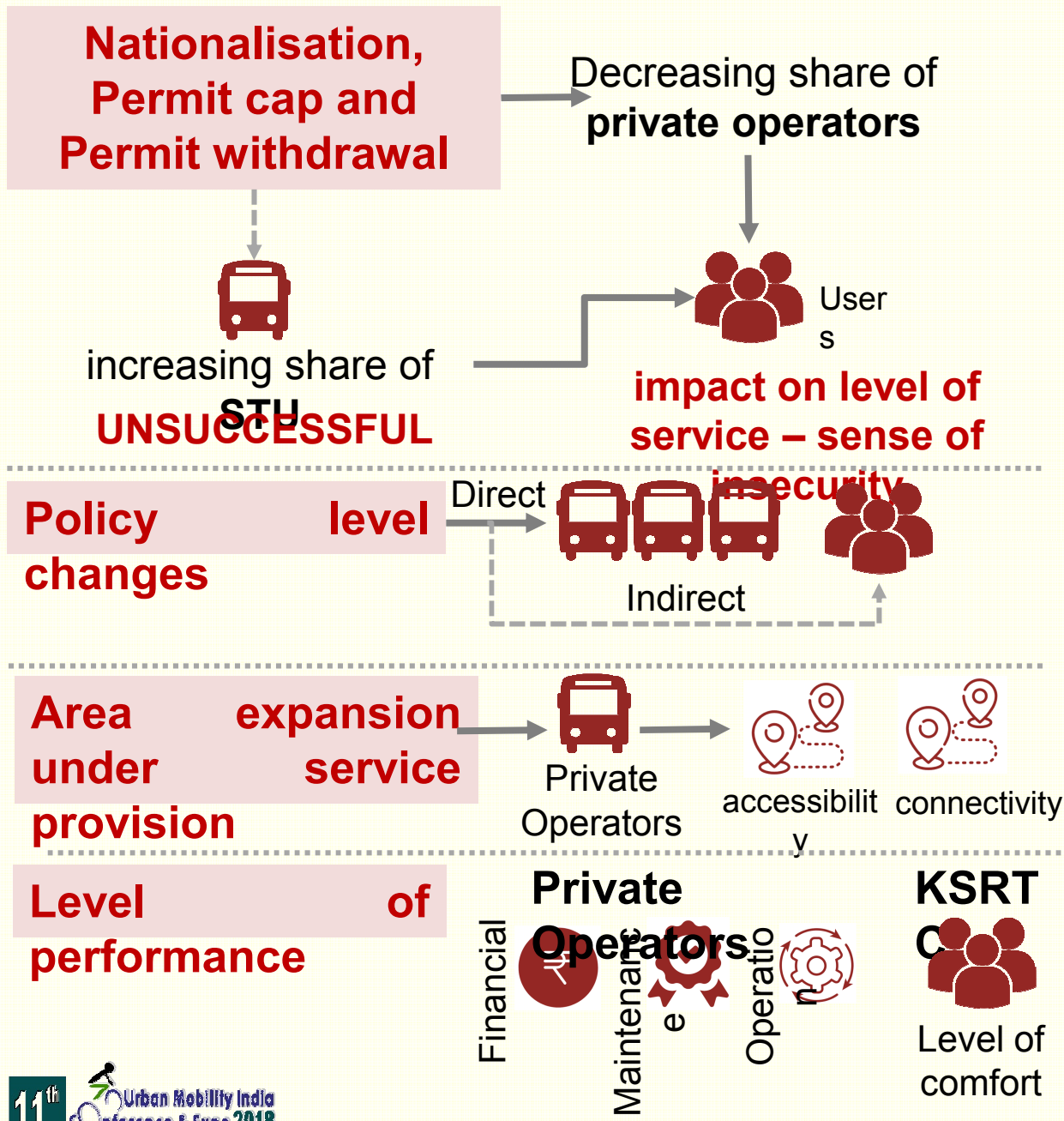


Source: Primary survey



FACTOR	MODE		
TIME	Bus Availability		
	Private	KSRTC	KURTC
	Waiting time at bus stop		
	Private	KSRTC	KURTC
	Fast service / Average time taken		
KSRTC OPERATORS HAVE BETTER LEVEL OF SERVICE OVER PRIVATE OPERATORS AND KURTC OPERATORS			
COST	Private	KSRTC	KURTC
	Fare vs quality		
	Private	KSRTC	KURTC

SUMMING UP



Whether the permit cap and permit withdrawal are desirable interventions in regulating bus transportation systems? Is the policy framework of today apt for strengthening of city bus services of Kochi?

How do we manage current bus operators so that they function more efficiently?

RECOMMENDATIONS

Permit cap and permit

withdrawal of rethinking **Government strategies** - **monopolization of STU** - involve public operators in service provision.

Permit cap should be raised off - encourage more private operators

Amendment in Acts and

Policies
Amendment in Motor Vehicle Act Chapter VI - service provision and liberalize public transport

The **inter-district permit withdrawal** - **taken off** to encourage more private operators

The State should make **necessary policy changes** - to **facilitate service to unserved areas**

Enhancing efficiency of operators

More permits - private operators - match the **service level quality of KSRTC operators**

Reducing accidents - suspension of permits of operators involved in causing accidents

Improving operational efficiency of KSRTC operators to **achieve better EPKM**

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THANK YOU