Transit Fare Policy, Structure and Technology

MIT – Transit Management Course

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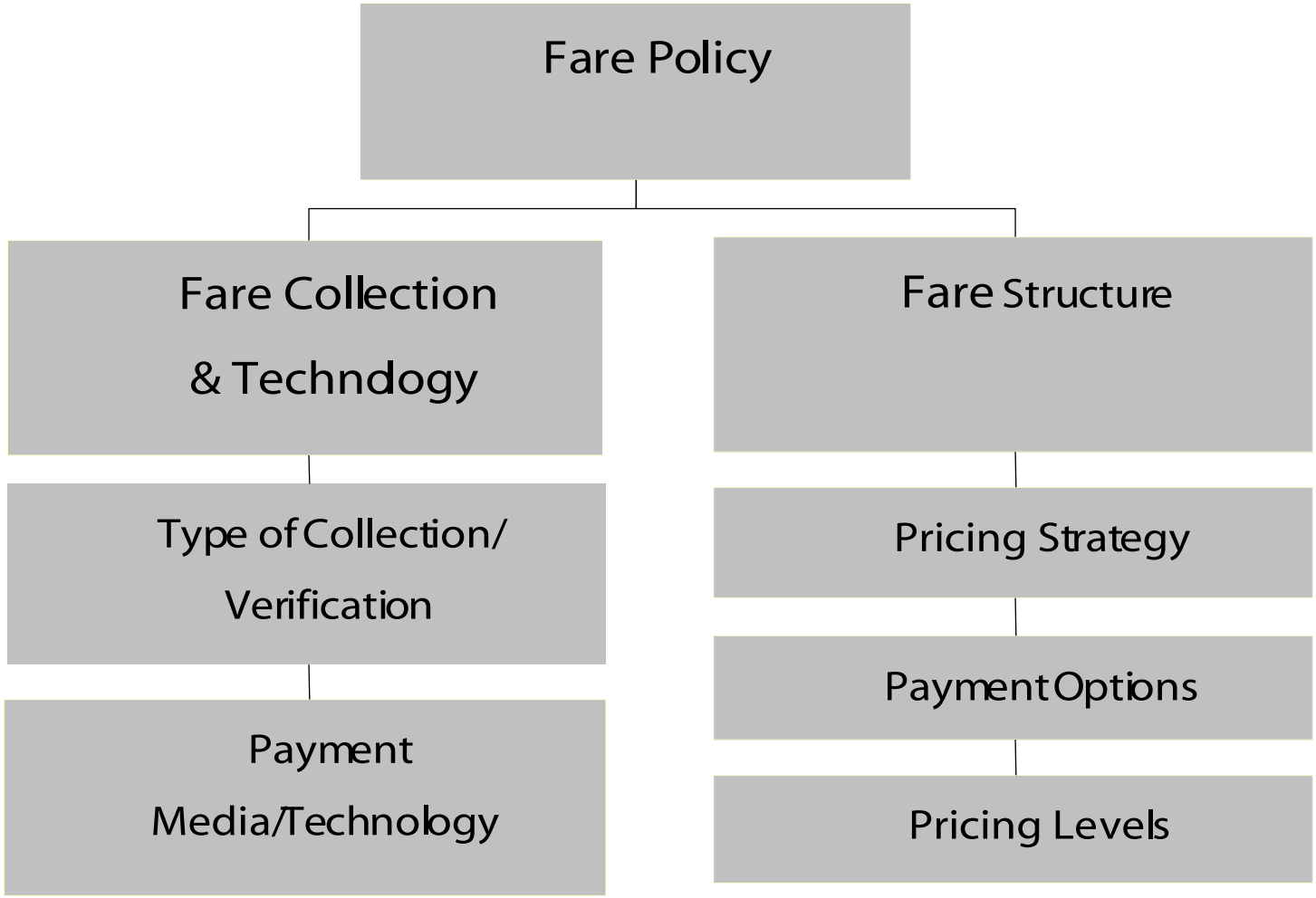
Fare System Parameters



Fare System Parameters (cont.)

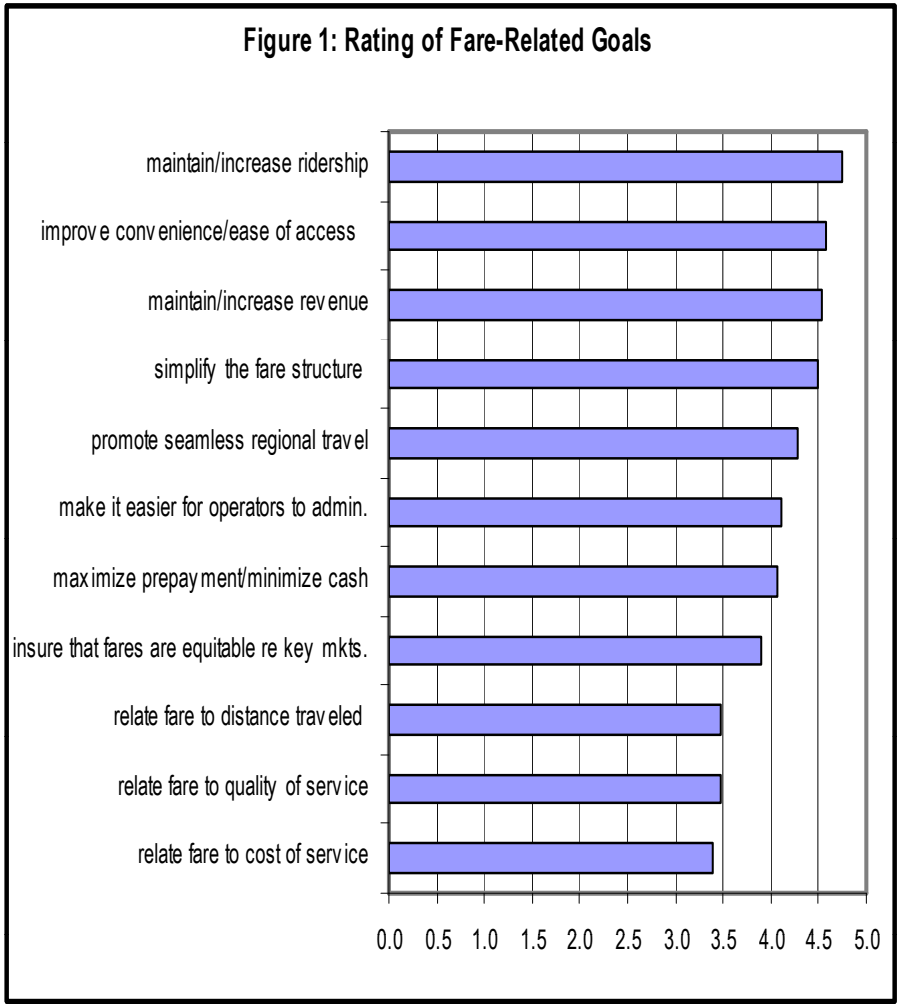
- Fare Policy
  - Principles, goals and constraints that guide and restrict a transit agency in setting and collecting fares
- Fare Structure
  - Pricing Strategy: general approach (e.g., flat fare vs. fare differentials)
  - Payment Options: forms of fare payment (e.g., cash, passes, multi-ride tickets, stored value)
  - Transfer Policy: price and use parameters
  - Pricing Levels: actual fare amounts for each payment option
- Fare Collection and Technology
  - Type of Collection/Verification: how fares are paid and inspected (e.g., barrier, self-service/POP, pay on board)
  - Payment Media/Technology: type of payment media and equipment (e.g., magnetic, smart card)

Importance of Fare Policy

- Fare policy affects all aspects of transit system
  - Administration – fare changes tend to be publicly scrutinized & debated
  - Finance – fares are important source of revenue
  - Customer Service -- fare payment is first aspect of transit a customer encounters; complexity and ease of access to prepaid options important customer service factors
  - Marketing – fares affect perception of transit system in the community; fare change or new technology need to be marketed effectively, and offer key general marketing opportunities
  - Operations – fare structure affects ridership levels and thus amount of service needed; fare structure/technology also affect boarding/dwell times and thus service reliability
  - Planning – fare structure/technology affect accuracy of fare data

Fare Policy Goals

- Customer-related (e.g., ridership, ease of use, complexity, range of options, equity)
- Financial (e.g., revenue, fare abuse, revenue control, collection costs)
- Management-related (e.g., data collection, modal integration, flexibility, operations)
- Political (e.g., political acceptability, cost recovery)



Fare Structure

- Elements include:
  - Base (single-ride) fare
  - Level(s) of any differentials
  - Transfer policy/pricing
  - Pass pricing and multi-ride discount/bonus
  - Reduced fare levels (e.g., seniors/disabled, students)
- Methodology for selecting fare levels/changes
  - Establish criteria (i.e., related to goals)
  - Develop ridership/revenue model -- choice coefficients, elasticities, use of existing options by submarkets)
  - Develop scenarios consisting of above elements
  - Use model and criteria to evaluate scenarios
  - Present recommendations to Board

Table 1: Evaluation Criteria -- Decision Guidelines

Evaluation Criteria	Measures/Guidelines	Comments
Maintain or increase revenue	-1= 0.5% -- 2% decrease 0= 0.5% decrease -- 0.5% increase 1= 0.5% -- 2% increase	from Fare Model
Maintain or increase ridership	-1= 0.5% -- 2% decrease 0= 0.5% decrease -- 0.5% increase 1= 0.5% -- 2% increase	from Fare Model
Provide seamless fare system	-1=no transfers (and no day pass) 0=no change from current 1= free transfers or day pass	related to ease of transfer between local and regional service
Simplify fare structure and reduce problems associated with fare structure	-1=retention of zones 0=reduced no. of zones 1=elimination of zones, no pk/off-pk	relates to ease of rider use and operation/ administration; "0" if no zones but pk/off-pk
Reduce fare collection operating & admin. costs	-1=lower prepayment discounts 0=no change from current 1= increased prepayment discounts	¡ ncreased prepayment results in less cash to handle; relates to pass and st. value/multi-ride discounts
Maximize public acceptability	-1=large cash increase 0=small change in cash fare 1=no change in cash fare	reflects public opposition or acceptance; "1" if small cash change and deeper discount; "-1" if fare > $1.35

Pricing Strategy

- Flat vs. differentiated fares
  - Flat fare (same base fare throughout system)
  - Zone/distance-based fares
  - Time-of-day differential
  - Express or rail premium
- Most agencies (except commuter rail) have flat fares
  - Zone/distance: 30% of bus systems, 20% heavy rail, 27% LRT, 90% CR
  - Peak/off-peak: 4% of bus systems, 7% heavy rail, 14% LRT, 28% CR
  - Express premium: 23% of bus systems
- Use of differentiation declining; agencies increasingly deciding that disadvantages outweigh advantages

Pricing Strategy (cont.)

- Trade-offs, flat vs. differentiated fares
  - Differentiation advantages include more equitable (fare reflects cost of providing service), potential for higher revenue
  - Flat fare advantages include simpler, easier to administer, potential for higher ridership
- Type of fare collection and technology a factor
  - Distance and time-based differentiation difficult to administer/enforce without electronic payment
  - Zonal/distance-based works best if farecard swiped/tagged on entry and exit (i.e., “tag on/tag off”) on bus and LRT; required on heavy rail
  - Peak/off-peak differential not well-suited to POP system even with electronic payment

Fare Technology

- Paper tickets
- Tokens
- Magnetic farecards
  - Read-only (to validate passes)
  - Read-write (for stored-value and other options)
- Smart cards/other chip-based options
  - Contactless payment most appropriate for transit
  - Lower-cost “disposable” contactless paper cards now available
  - Other form factors available (e.g., key fobs, chip-based cell phones)

Type of Fare Collection

- Basic types -- how fares paid/inspected
  - Barrier
  - Pay on boarding
  - Proof-of-payment
  - Conductor
- Considerations
  - Mode of service
  - Demand level
  - Fare structure
  - Space constraints
  - Capital vs. operating costs

Role of Fare Policy in Decision-Making

- Some agencies have comprehensive fare policy statements; these may include:
  - Long-term goals (e.g., maximize ridership, maximize revenue, maximize social equity)
  - Short-term objectives (e.g., recovery ratio or ridership target)
  - Guidelines for reviewing/changing fares (e.g., review annually,tie fares to inflation)
- More common impetus for fare structure/pricing change: response to particular issue or problem (e.g.,revenue shortfall)
- Few agencies make fare changes on regularly-scheduled basis

Decision-Making Scenarios

- Policy-driven: agency makes fare structure changes to address specific goals (e.g., simplify, insure equity, increase ridership or revenue)
- Technology-driven: agency makes fare structure changes to take advantage of new technology (e.g., smart card)
- Service-driven: agency makes fare structure changes to accommodate new mode or service (e.g., LRT, express bus)

Emerging Fare-Related Factors and Issues

- Equity/environmental justice concerns
- Increased adoption of electronic fare media
- Focus on providing “seamless” travel in a region (i.e., multi-agency integration)
- New programs/partnership opportunities
  - University programs
  - Employer programs
  - Other (non-transit) applications

Equity and Environmental Justice Issues

- Fare decision-making increasingly influenced by political or legal factors
  - Concern re equal treatment of all groups
  - Organized opposition or legal action against proposed fare increases
- Can define/limit fare structure changes
  - Consent Decree in LA
  - Free transfers, weekly pass in Boston
  - Very deep discount in Philadelphia

Fare Payment Technology Developments

- Electronic media influencing fare policy
- Increasing range of payment options facilitated by electronic media
- Expanding use of smart cards/other options
  - Regional farecards
  - Multiapplication opportunities
  - Use of bankcards for transit
  - Use of chip-based cell phones (Near Field Communications or NFC)

Electronic Payment Options

- Stored value -- various forms of bonus/discount
  - Purchase bonus
  - Add-value bonus
  - Discounted single ride with use of smart card
- Rolling passes
  - 7-day, 14-day, 30/31-day – activate on first use
  - 1-day or partial day -- sold on board buses

Electronic Media Pricing/Reload Options

- Fare policy/pricing options
  - Guaranteed lowest fare (“best fare”)
  - Guaranteed last ride/negative balance
  - Frequency-based bonus/discount
- Autoload arrangements
  - Individual account-based programs (e.g., CTA)
  - Employer programs (e.g., MBTA, WMATA)

Regional Payment Integration

- Growing emphasis on multi-agency payment integration
- Fare policy/structure strategies
  - Develop common fare structure elements (e.g., regional passes, free or reduced interagency transfers) OR
  - Allow each agency to retain own fare structure; all agencies accept common stored value
- Emerging programs all involve smart cards
- Examples: SF Bay Area, Los Angeles, San Diego, Ventura Co., Washington-Baltimore, Minneapolis/St. Paul, Seattle, South Florida

Multiapplication Programs

- Transit and other transportation modes
  - Parking (e.g., WMATA)
  - Toll, parking (e.g., Orlando, Singapore)
- Transit and non-transportation applications
  - Banks (e.g., London/Barclay, LA Metro/Visa)
  - Retail (e.g., Hong Kong)
  - ID, access, security (e.g., WMATA/GSA)
- Use of bank cards for fare payment
  - Magnetic credit cards in fareboxes (e.g., Nashville)
  - Contactless credit/debit cards at faregates or fareboxes (e.g., UTA, NYMTA and PATH/NJT pilots)
- Use of cell phones for fare payment (NFC)
  - Chip-based or smart card-enabled phones (e.g., SF, NYC, London, Tokyo, S. Korea)

Example: Octopus (Hong Kong)

- Smart card-based regional fare payment program: 8 bus, rail and ferry operators
- Created by consortium of operators in 1996
- Used by 95% of HK population; more than 10 m daily transactions
- Card can also be used for various purposes (e.g., convenience stores, supermarkets, fast food restaurants, parking meters/lots, telephone calls)

Example: Oyster (London)

- Smart card-based regional fare payment program
- Privately financed and operated (DBOM contract); 30 banks involved
- “Best fare” arrangement (i.e., daily “capping”)
- Transit application added to credit cards (Barclaycard “One Pulse” card)
- NFC (cell phone) use has been tested
- Non-transit applications envisioned including parking, school services, electronic benefits, retail/loyalty programs

Example: Charlie Card/Ticket (Boston)

- MBTA AFC program
  - Newly designed validating fareboxes
  - New faregates and TVMs
- Charlie Card – smart card
  - Period pass (employer-based autoload)
  - Stored value (lower fare than with Charlie Ticket or cash)
- Charlie Ticket – magnetic farecard
  - Stored value
  - Change card (from farebox)
- 2.7m Charlie Cards distributed (1.6m have been used); 68% of boardings done using Charlie Card

Example: Chicago Card

- CTA smart card program
- Initially, lower fare (rail) with smart card than with magnetic card, and lower fare (bus) with smart or magnetic card than with cash; as of 1/09, lower fare bus only
- Pilot test in 2000
- Introduced Chicago Card Plus in 2004 -- account-based system
  - Rider sets up credit card account; value debited from account when card used
  - No actual value (or pass) on card

Example: Clipper (SF Bay Area)

- Regional smart card-based program: plan to ultimately link 26 or more operators
- Currently called TransLink, but changing name to Clipper
- Pilot completed$_W$ ith 6 operators July 2002
- Currently operational at 5 operators
- Uses dual interface cards, to allow for future multiapplication arrangements (e.g., parking, telephones, universities)

Example: SmarTrip (Washington area)

- Regional smart card-based program for Washington-Baltimore-Northern VA region
- Initiated by WMATA for Metrorail and parking in 1999
- Rider pays $5 for card and registers card – for replacement if lost/stolen
- Multiapplication pilots with Citi, GSA
- Smart Benefits – automated downloading of employer benefits

Summary

- Fare policy affects all aspects of transit system: administration, finance, customer service, marketing, operations, planning
- Fare policy needs to balance competing goals (e.g., ridership vs. revenue, simplicity vs. equity)
- Most fare decisions made in response to specific problem -- or introduction of new technology or service
- Broader context for fare policy and fare collection strategies in recent years
  - Increase in equity concerns/complaints
  - Changing markets, new partnership opportunities
  - Focus on seamless regional travel
  - Convergence of transit and non-transit payment technologies (e.g., acceptance of contactless credit/debit cards and cell phones for transit payment)

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