Transit Cost Analysis

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Types of costs

☐ Fixed Cost: does not vary with the amount of service provided in the short run.

☐ Variable Costs: change with the amount of service provided.

☐ Average Cost: total cost (fixed and variable) divided by output i.e., cost per pla

Principles - 1

☐ Compare the world with it versus the world without it.

☐ The purpose of the analysis dictates the way you analyze costs.

  ◼ Analysis of the costs of a service change: use the incremental or marginal cost

  ◼ Analysis of a new system: look at total costs: administration, vehicle purchase, facilities, hiring, training and operations.

  ◼ Allocation of deficit, revenue: take costs and allocate them to individual routes. What is their share of revenue, deficit?

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Principles -2

☐ Service changes are incremental -- you save money by cutting pieces of work -- value of one to seven hours saving is zero.

☐ The extra cost of using vehicles in off peaks is likely only a portion of the per mile cost, i.e. extra fuel and maintenance costs, drivers are already there.

☐ Seek to fill seats in off peaks, discount pricing, service for different markets - university, school trips, etc.

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Cost models

- ☐ Simple extreme
  - ■ Average system cost per unit of service, i.e. total cost/hour, used for quick calculation, analysis of a new system. will overestimate savings of a service cut or costs of a service expansion since it includes fixed as well as variable costs.
- ☐ Complex extreme
  - ■ Reschedule the whole system to look at the effect of a change, used to implement services and for budgeting for next system change.
- ☐ Intermediate
  - ■ Cost models with a limited number of variables – cost per hour + cost per mile + cost per vehicle.

Cost allocation

- ☐ Go through system budget, determine if costs vary with
  - ■ time (wages, benefits)
  - ■ distance (fuel, maintenance of vehicles)
  - ■ fleet size (administration, advertising, fixed costs)
- ☐ Allocate costs to each category
- ☐ Determine cost per vehicle hour, vehicle mile and vehicle
- ☐ Example: Annual Total Expense = ($10.11 * Vehicle Hours) + ($.30 * Vehicle Miles) + ($17,075 * Vehicles)

Example: original budget (part)

	Expense Item		Annual Expense	
TRANSPORTATION EXPENSE				
	Driver Wages and Salaries		$195,000	
	Driver Fringe Benefits		42,900	
	Fuel and Oil		42,500	
	Tires and tubes		6,500	
	Vehicle Insurance		39,500	
	Vehicle Lease		6,500	
	Purchased Transportation		46,900	
	Other		3,460	
TOTAL TRANSPORTATION EXPENSE				$379,760

Allocation to hours, miles or vehicles

Expense Item	Vehicle Hours	Vehicle Miles	Vehicle
TRANSPORTATION EXPENSE			
Driver Wages and Salaries	X		
Driver Fringe Benefits	X		
Fuel and Oil		X	
Tires and Tubes		X	
Vehicle Insurance			X
Vehicle Lease			X
Purchased Transportation	X		
Other	X		

Allocation in dollars

Expense Item		Vehicle Hour	Vehicle Mile	Vehicle
TRANSPORTATION EXPENSE				
Driver Wages and Salaries		$195,000		
Driver Fringe Benefits		42,900		
Fuel and Oil			$42,500	
Tires and tubes			6,500	
Vehicle Insurance				$39,500
Vehicle Lease				
Purchased Transportation		46,900		
Other		3,460		

Calculations

- ☐ Do the same for the rest of the budget.
- ☐ Add up costs per hour, mile and vehicle and divide by annual vehicle hours, vehicle miles and fleet size
- ☐ For service changes, use only per hour and per mile costs, unless there is a major change in fixed costs

Revenue Allocation

- What is the revenue of a bus route?
- Non-cash payments such as passes, transfers and permits complicates the allocation of revenue.
- Allocate on the basis of ridership or passenger miles, requires counts of boardings, transfers
- Easier if there are electronic registering fareboxes or automatic passenger counters.
- Loss of a short feeder may mean loss of revenue for a long trunk service as well.

Subsidy allocation

- If multiple local agencies subsidize the service, how much does each one pay?
- If the fare structure is not very complicated (i.e. no zone or express fares), can assume the average revenue per customer is the same for all routes, allocate based on boardings by route.
- Assume morning boarding on a feeder route is balanced by afternoon boarding on trunk route

Acknowledgements