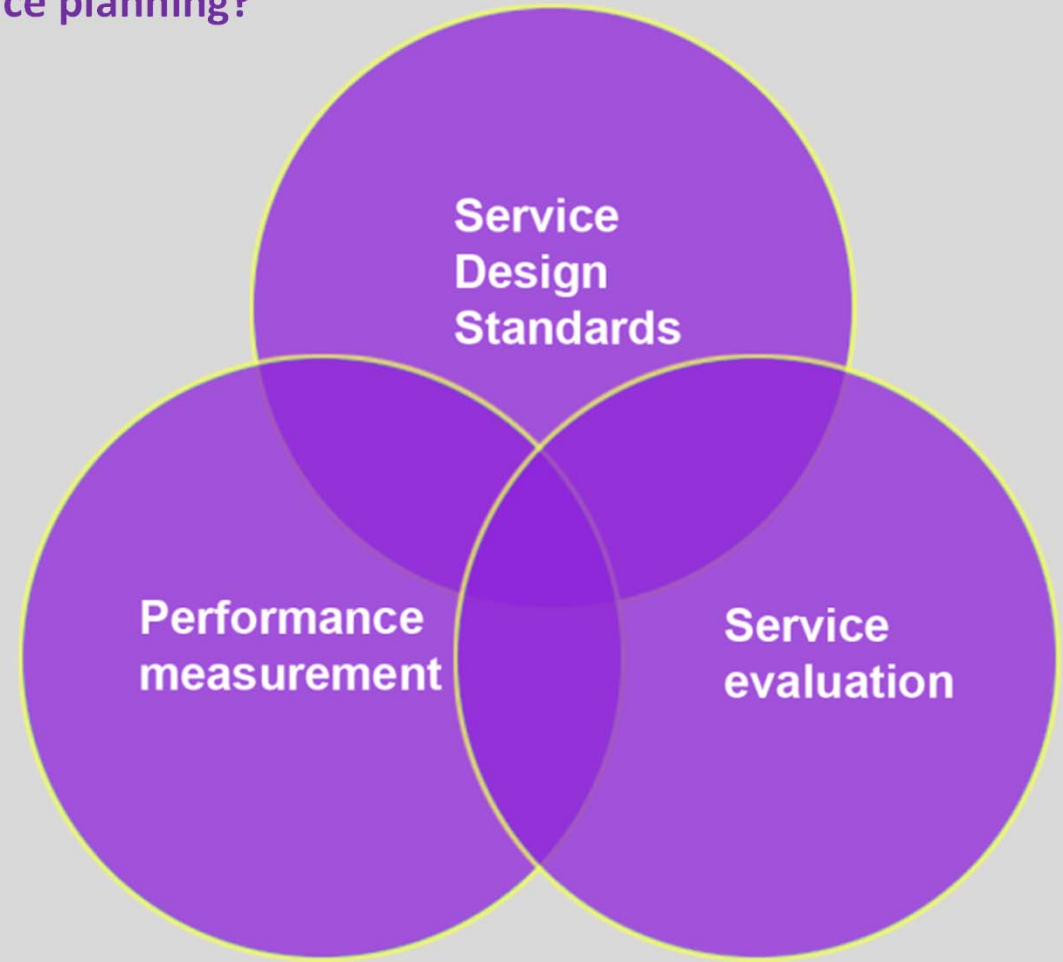
Basics of Transit Service Planning

ADOT Multimodal Planning

2014 Workshops for the 5311 program

Basics of Transit Service Planning

What is transit service planning?



Basics of Transit Service Planning

What are service design standards?

- What kind of service do you provide?
- What is the availability of this service?
- What is the travel time for this service and what is its capacity?
- How is the service delivered?
- What vehicle standards are adhered to?
- Is the service distribution equitable?

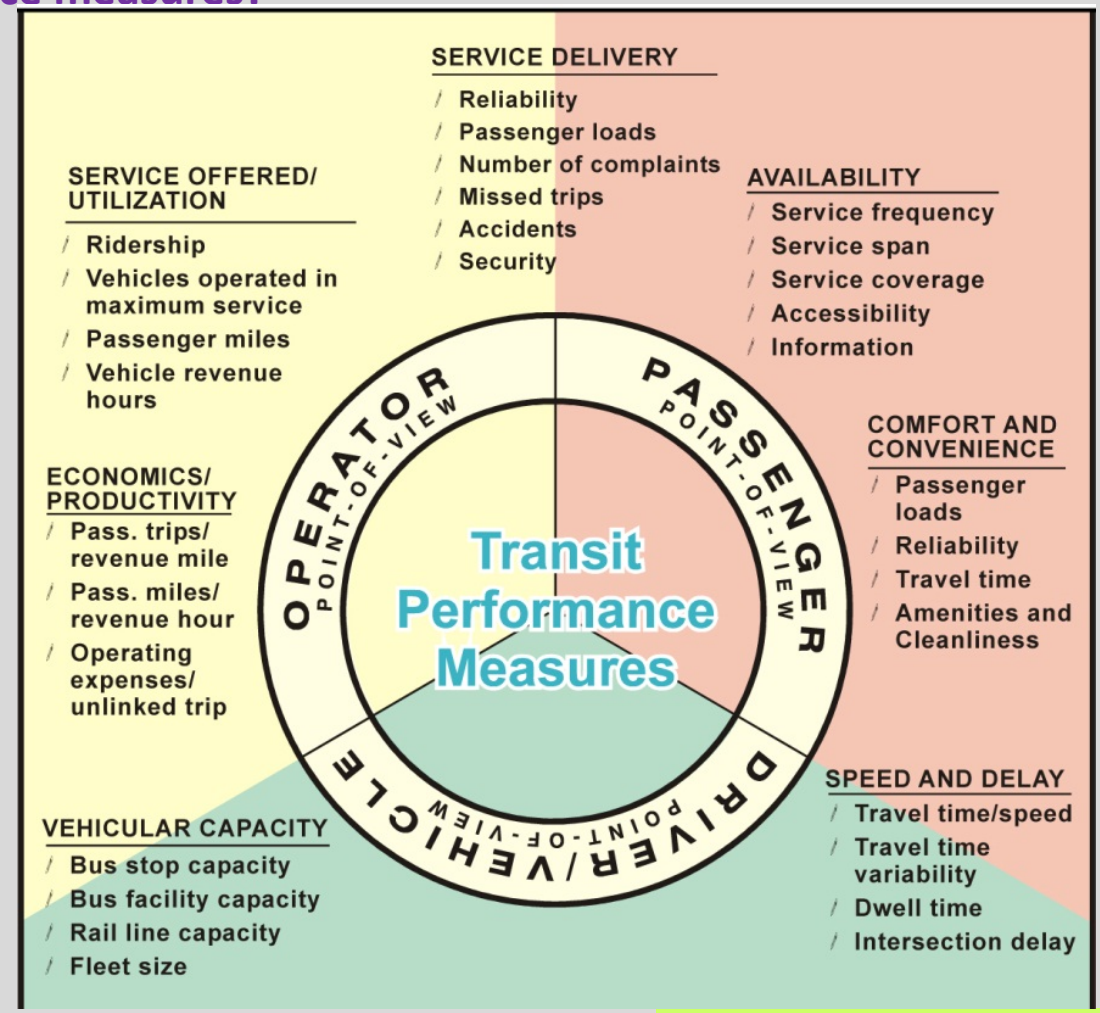
Basics of Transit Service Planning

What are performance measures?

Certain operational and financial parameters that indicate effectiveness and efficiency of a system or a route.

Basics of Transit Service Planning

What are performance measures?



Source : NTI Course work on transit planning

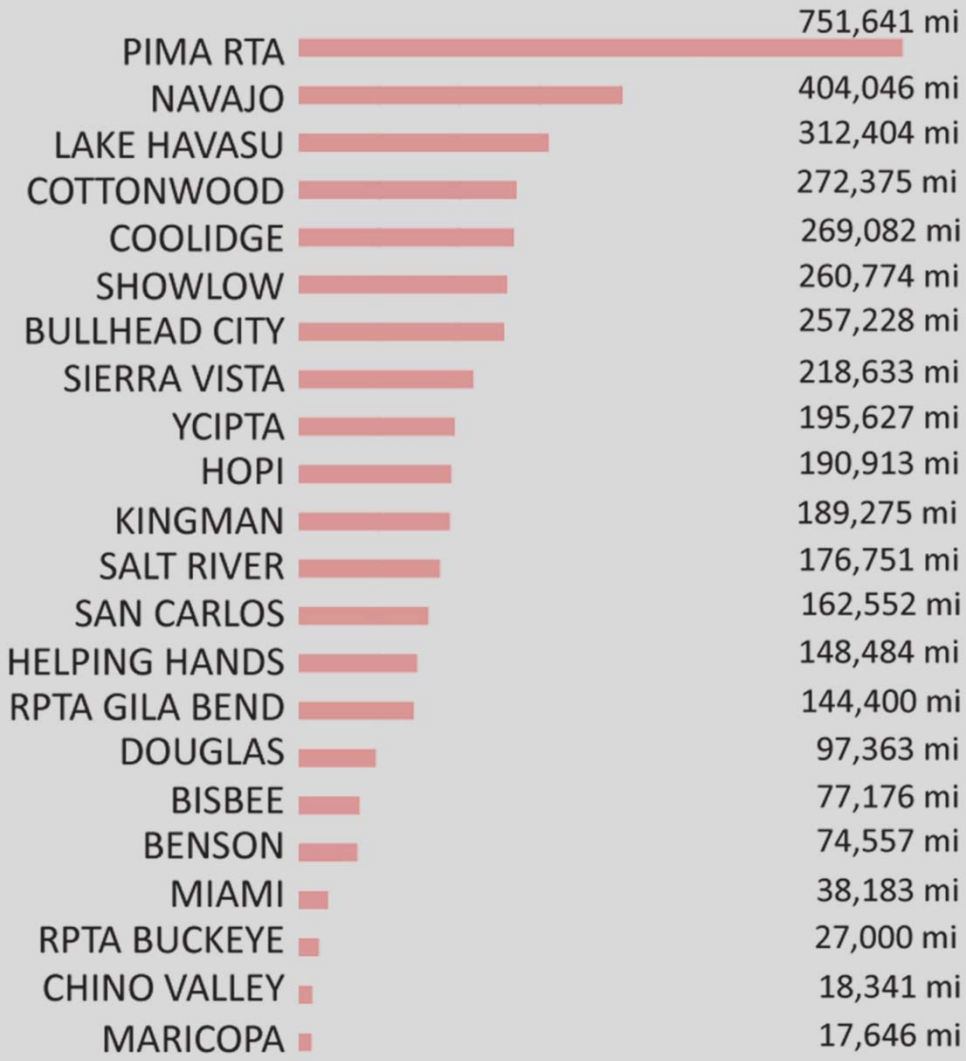
Basics of Transit Service Planning

What is service evaluation?

HOW ARE WE DOING?

PERFORMANCE METRICS

AZ 5311 Performance Metrics
ANNUAL REVENUE MILES



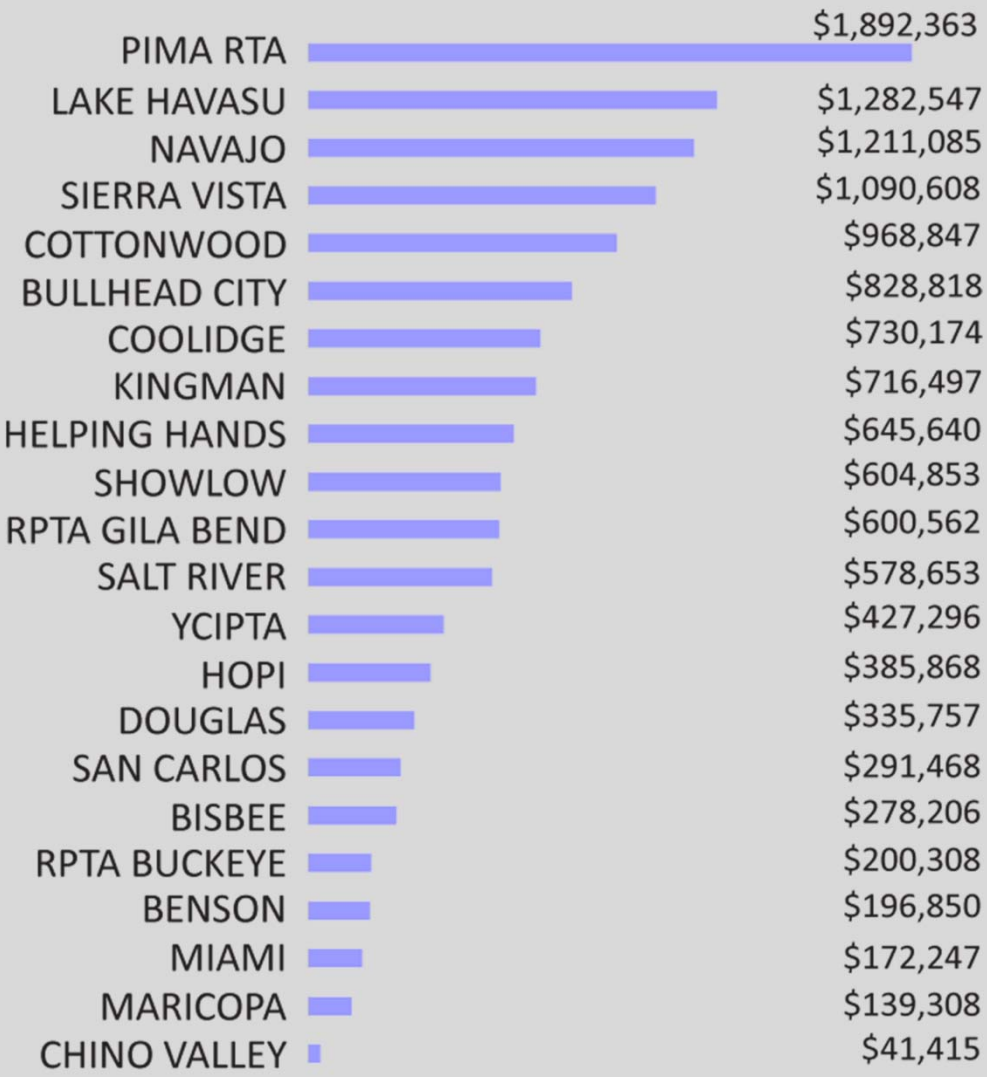
Total annual revenue miles operated in rural

AZ : 4,304,451

VM : 28,152,162

SOURCE :TPR 2013

AZ 5311 Performance Metrics
ANNUAL OPERATING COST



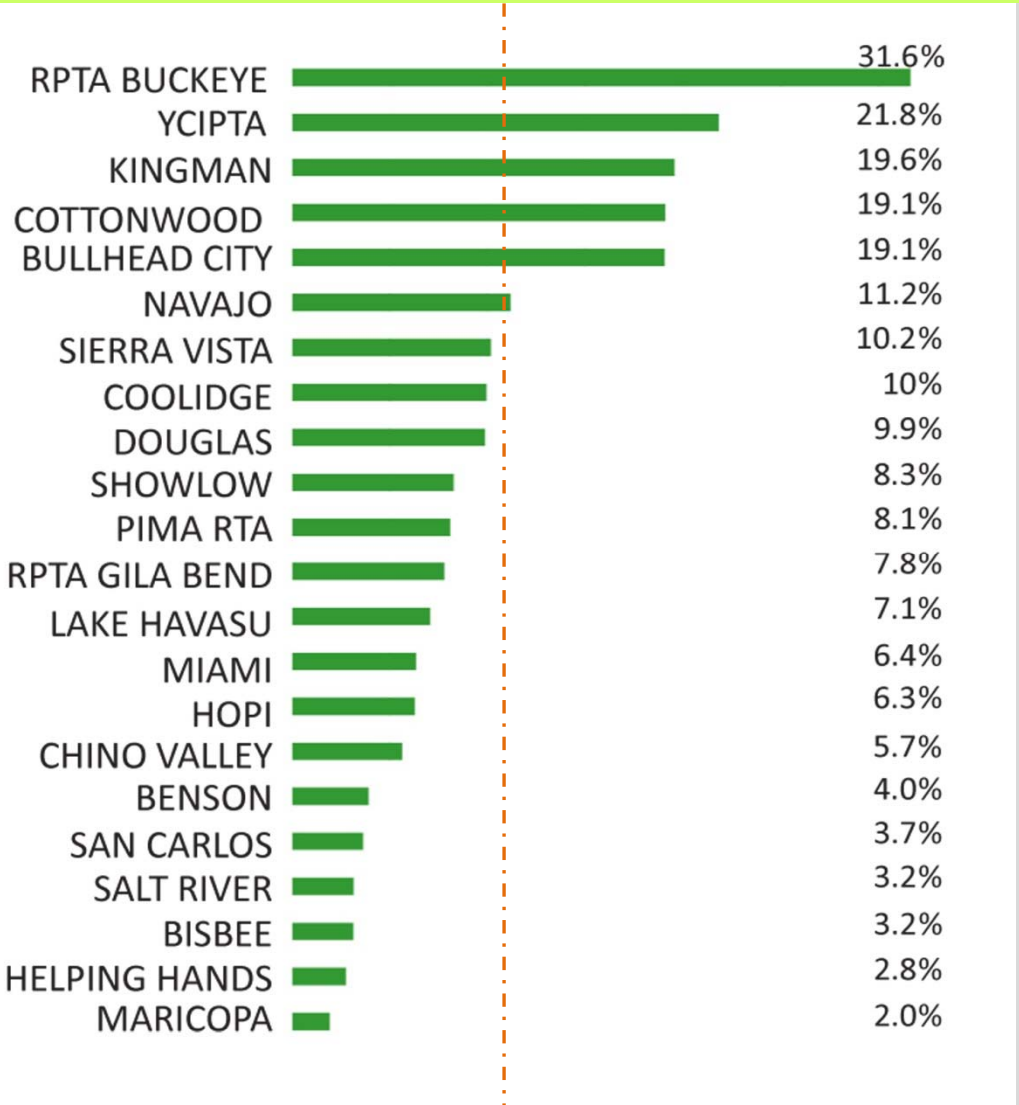
Total annual operating cost for in rural transit

AZ : $ 13,619,37

VM : $ 200 M

SOURCE :TPR 2013

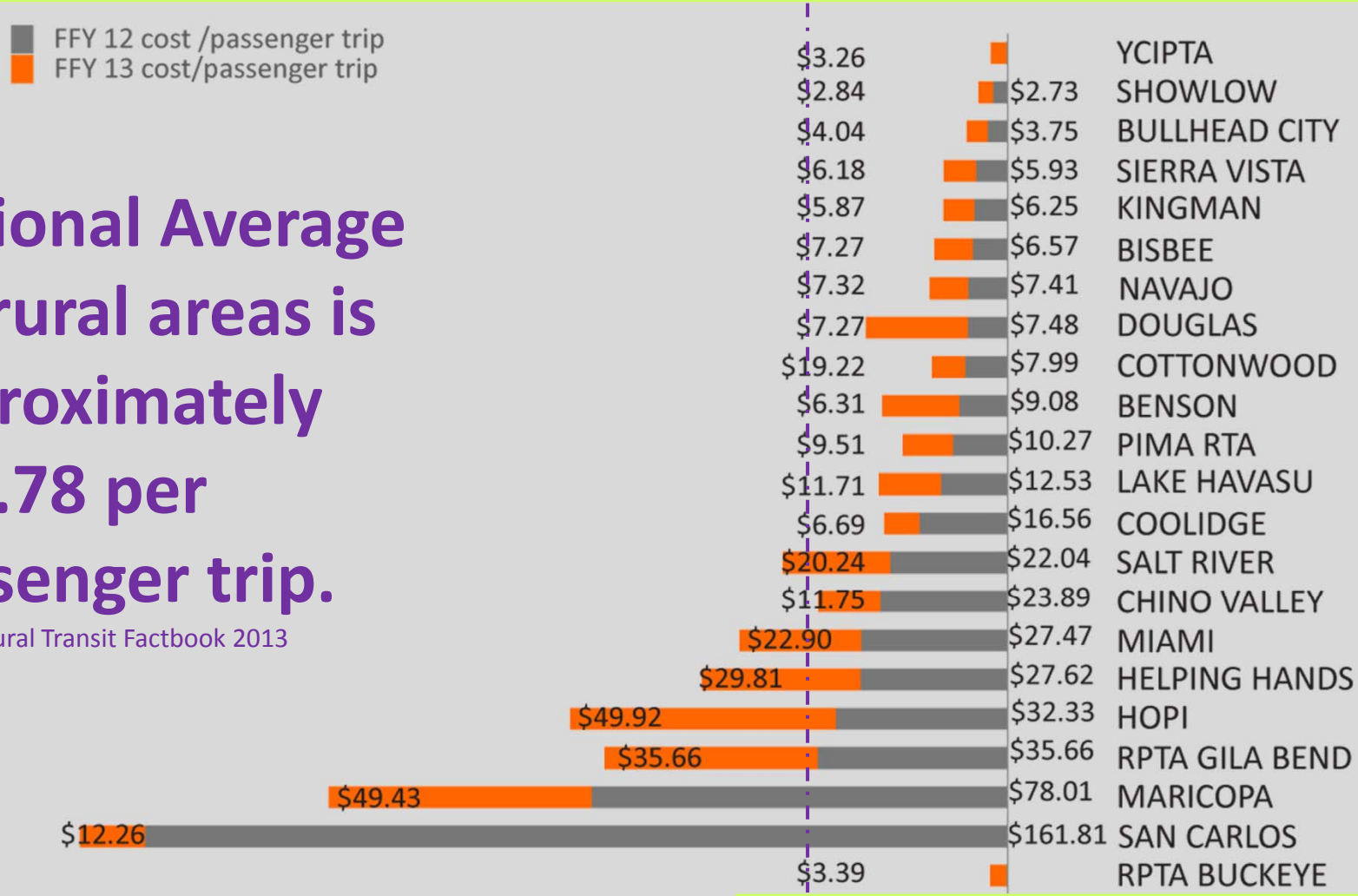
AZ 5311 Performance Metrics
F A R E B O X R E C O V E R Y



National Average for rural areas is approximately 10% farebox recovery

Source : Rural Transit Factbook 2013

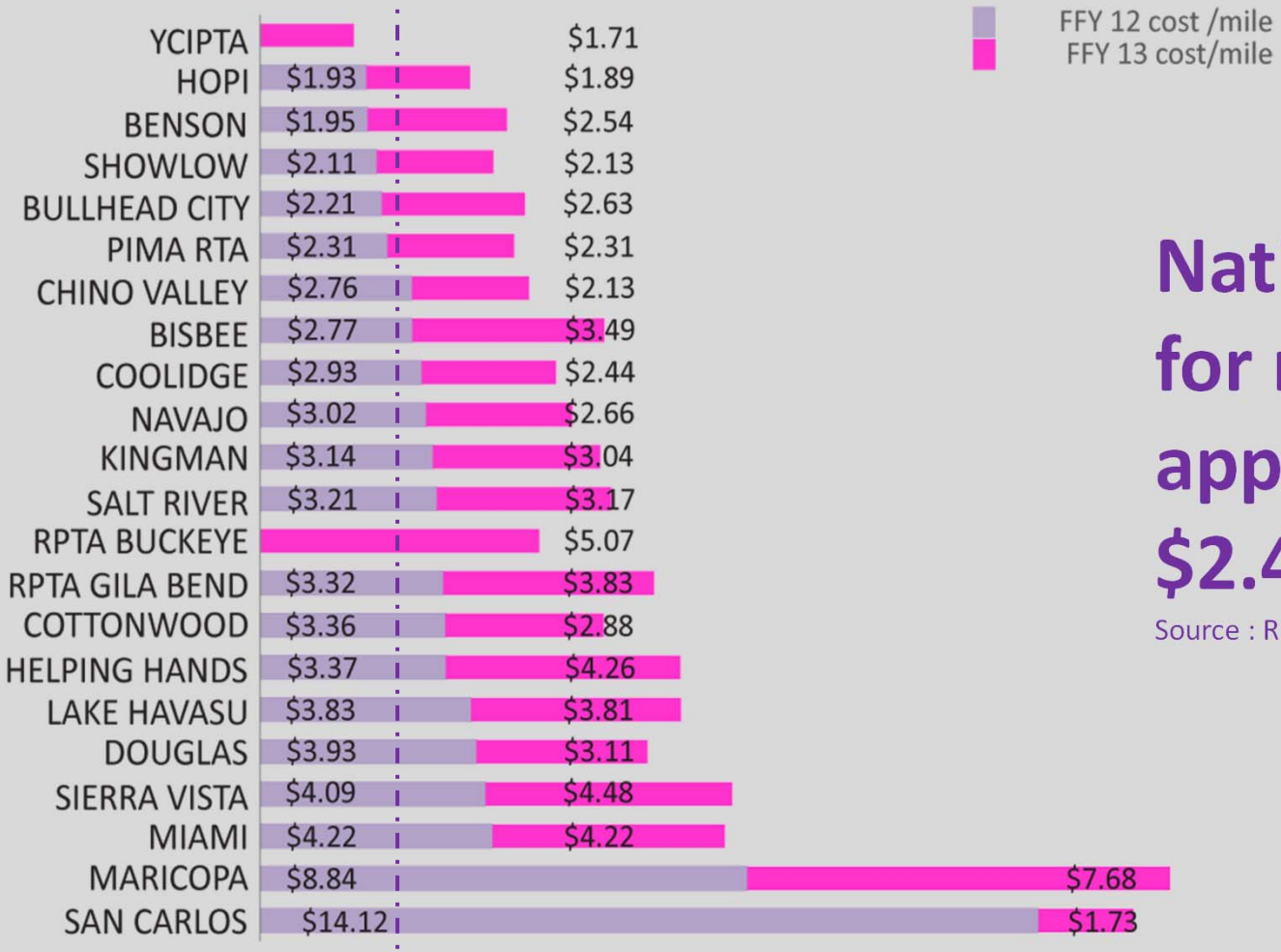
AZ 5311 Performance Metrics
OP COST PER PASSENGER TRIP



National Average for rural areas is approximately $10.78 per passenger trip.

Source : Rural Transit Factbook 2013

AZ 5311 Performance Metrics
OP COST PER REVENUE MILE



National Average for rural areas is approximately $2.49 per mile.

Source : Rural Transit Factbook 2013

P E R F O R M A N C E STANDARDS/GUIDELINES

TRANSIT GUIDELINES

TRANSIT BENEFITS : ECONOMY

- Per billion dollars of investment, public transit supports:
  - 36,000 jobs per year
  - $3.6 billion of added business output
  - $500 million in local, state, and federal tax revenue
- Regions also benefit from public transit cost savings and broadened labor markets
  - In the long term, this adds an additional $3.5 billion to GDP per $1 billion investment

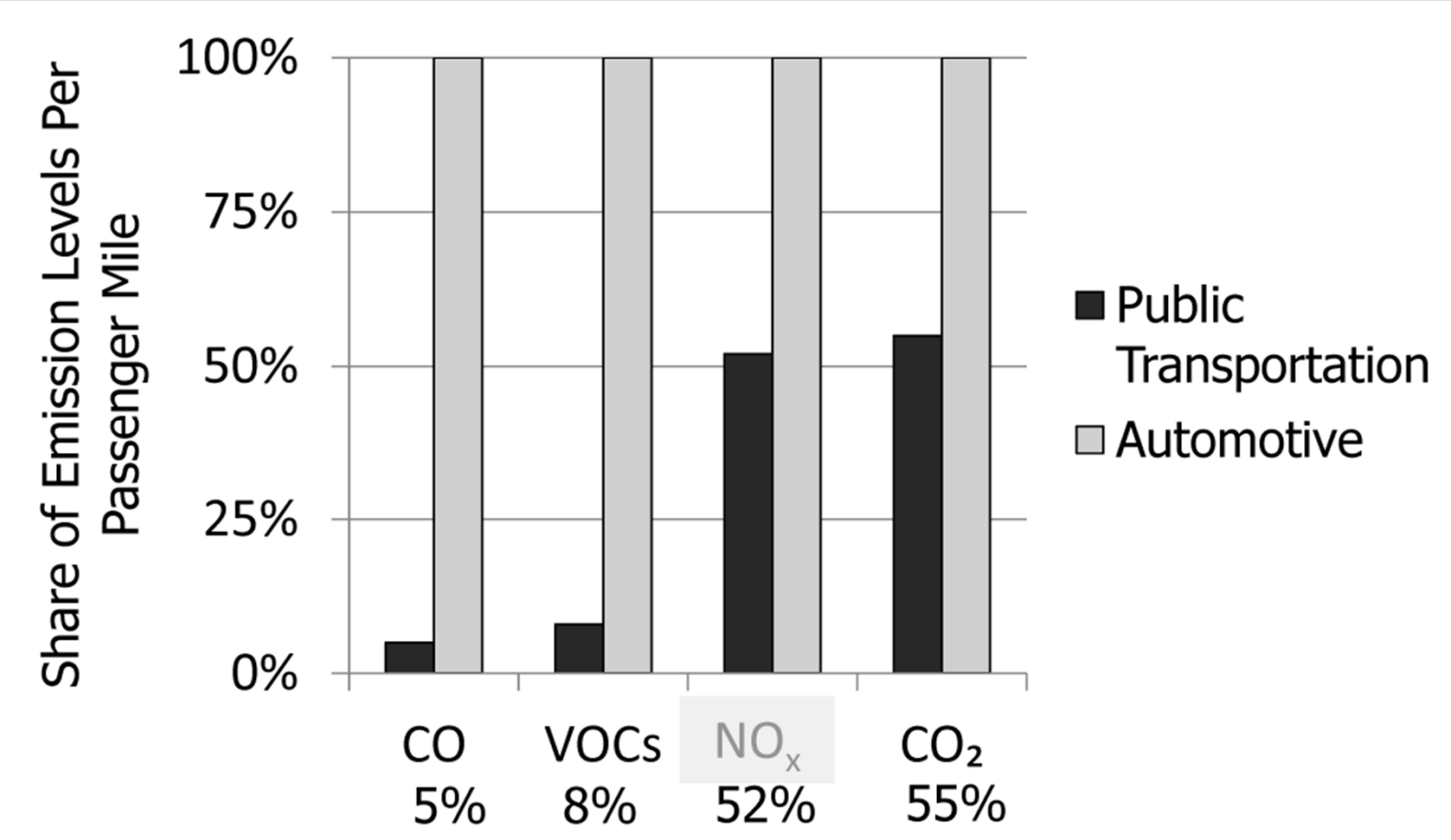
FTA

ADOT Multimodal Planning

Source : NTI Course work on transit planning

TRANSIT GUIDELINES

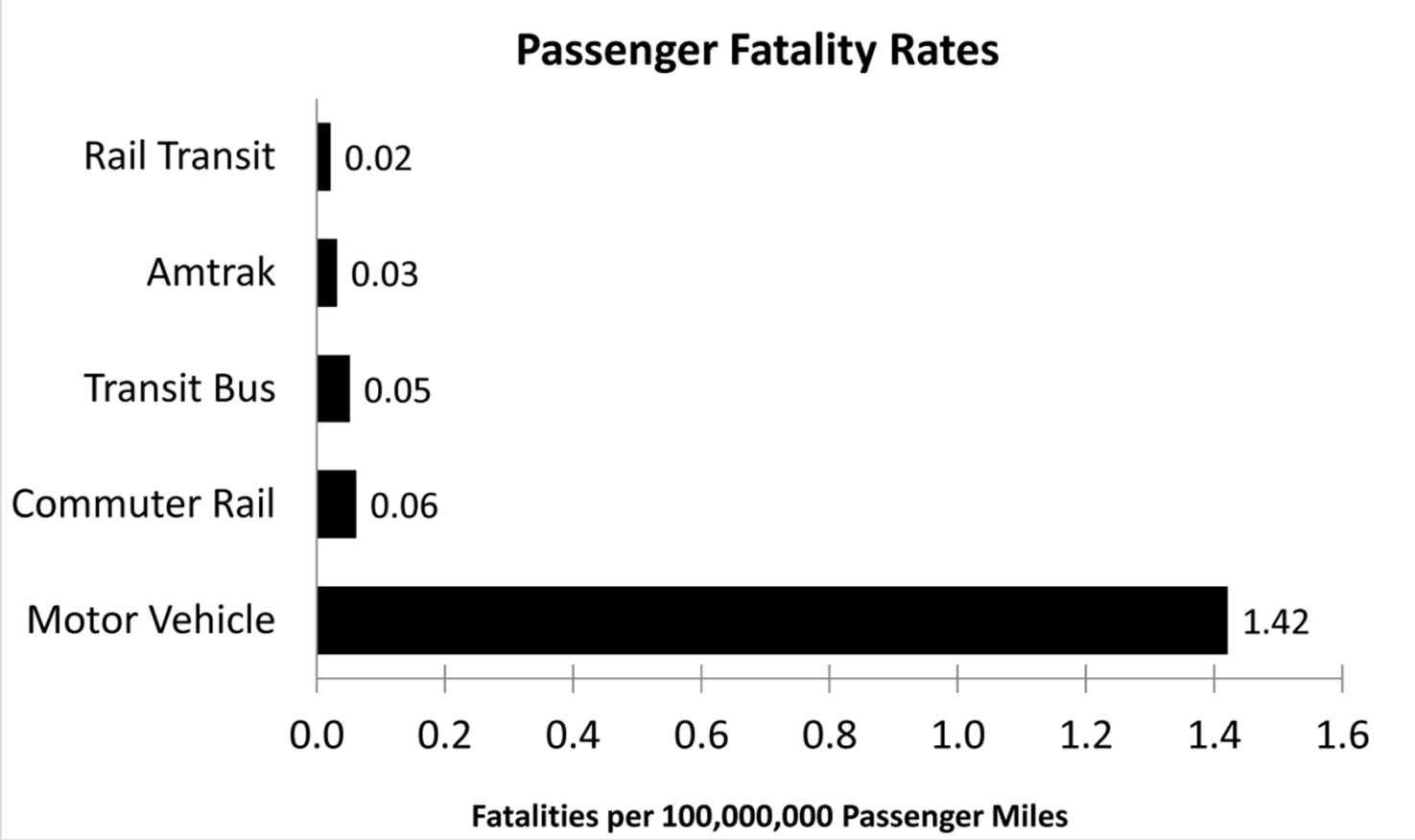
TRANSIT BENEFITS : ENVIRONMENT



Source : NTI Course work on transit planning

TRANSIT GUIDELINES

TRANSIT BENEFITS : SAFETY



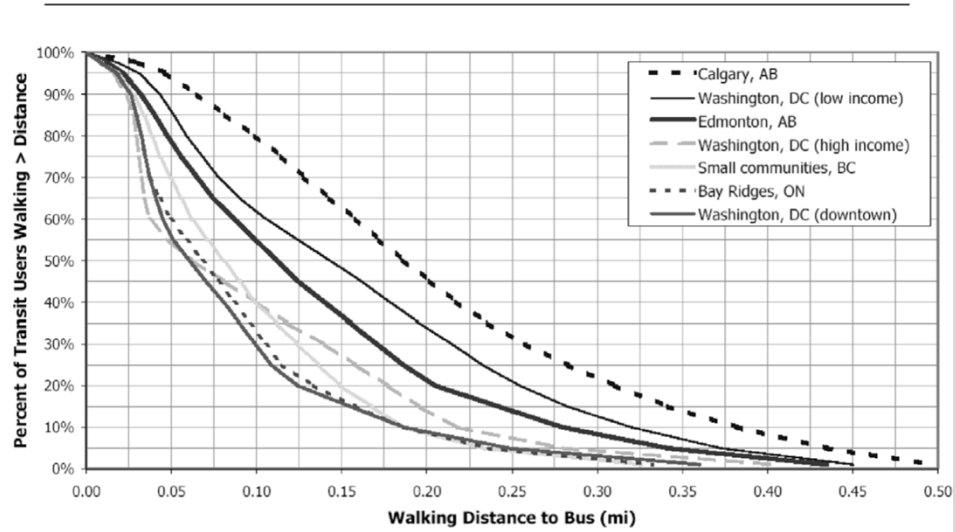
Source : NTI Course work on transit planning

TRANSIT GUIDELINES

TRANSIT DEMAND : RULE OF THUMB TO DETERMINE TRANSIT FEASIBLITY

	Households per acre	Jobs per acre
Low	At least 3	At least 4
Medium	3 to 10	4 to 20
High	Over 10	Over 20

TRANSIT CATCHMENT AREA : ¼ MILE



FTA FUNDS

PED IMPROVEMENTS WITHIN ½ MILE OF TRANSIT

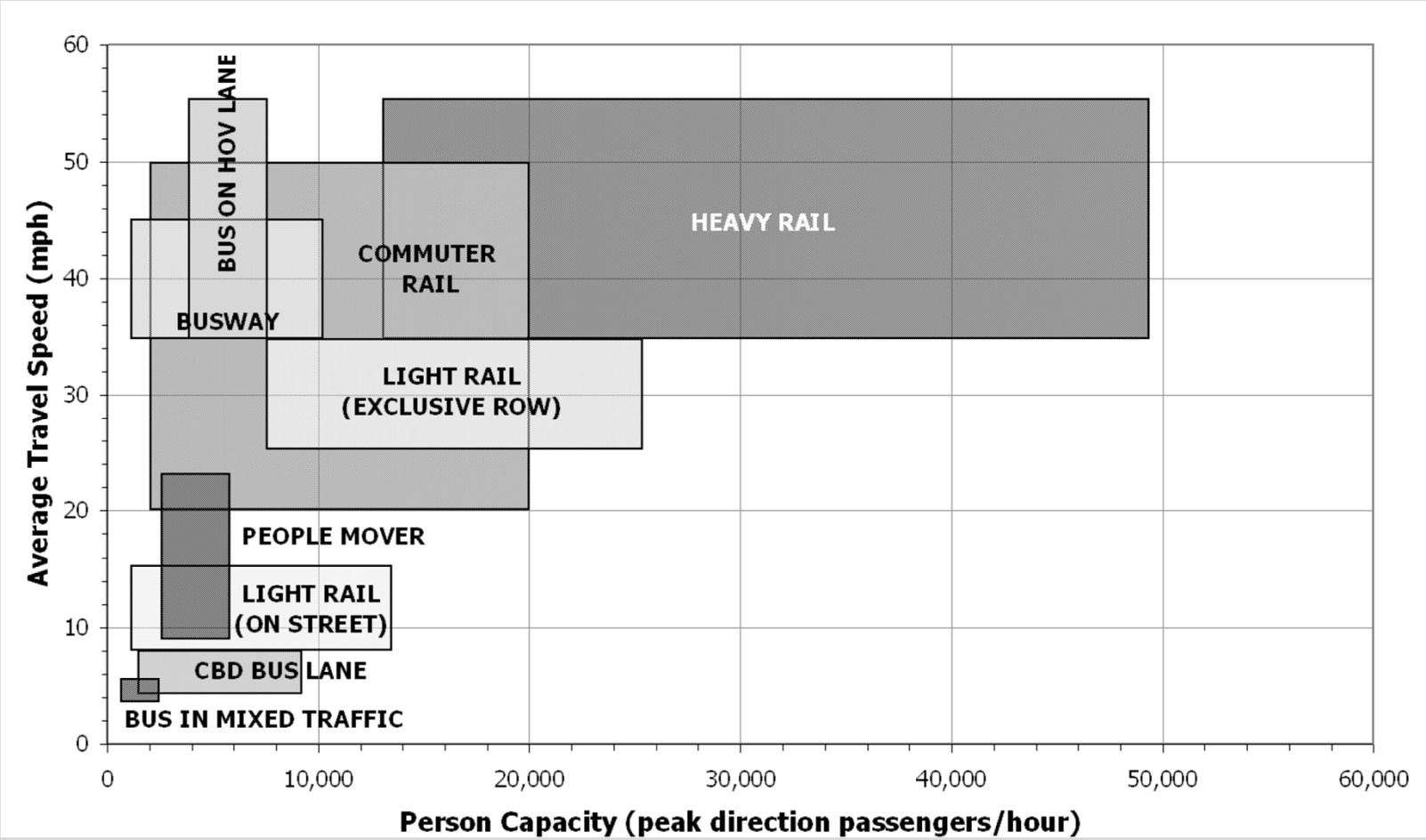
AND

BIKE IMPROVEMENTS WITHIN 3 MILES OF TRANSIT

Source : NTI Course work on transit planning

TRANSIT GUIDELINES

TRANSIT MODE BY PEAK HOUR TRAVEL DEMAND

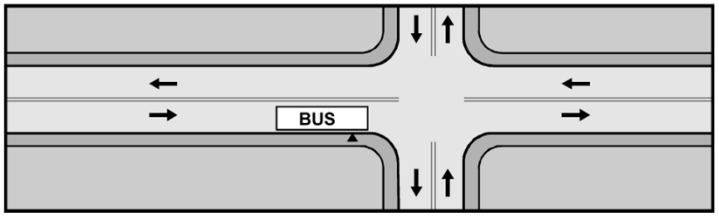


Source : Transit Capacity and Quality of service Manual, TCRP

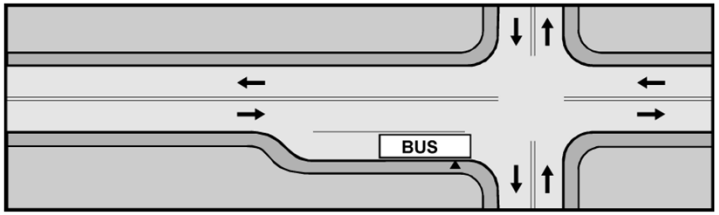
TRANSIT GUIDELINES

BUS STOP TYPES

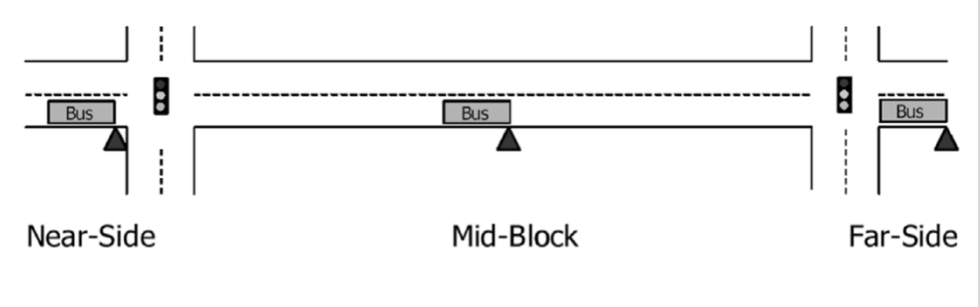
On-line



Off-line



BUS STOP PLACEMENT IN STREET



BUS STOP SPACING

Environment	Spacing range	Typical spacing
Central core areas of CBDs	300 to 1000 ft	600 ft
Urban areas	500 to 1200 ft	750 ft
Suburban areas	600 to 2500 ft	1000 ft
Rural areas	650 to 2640 ft	1250 ft

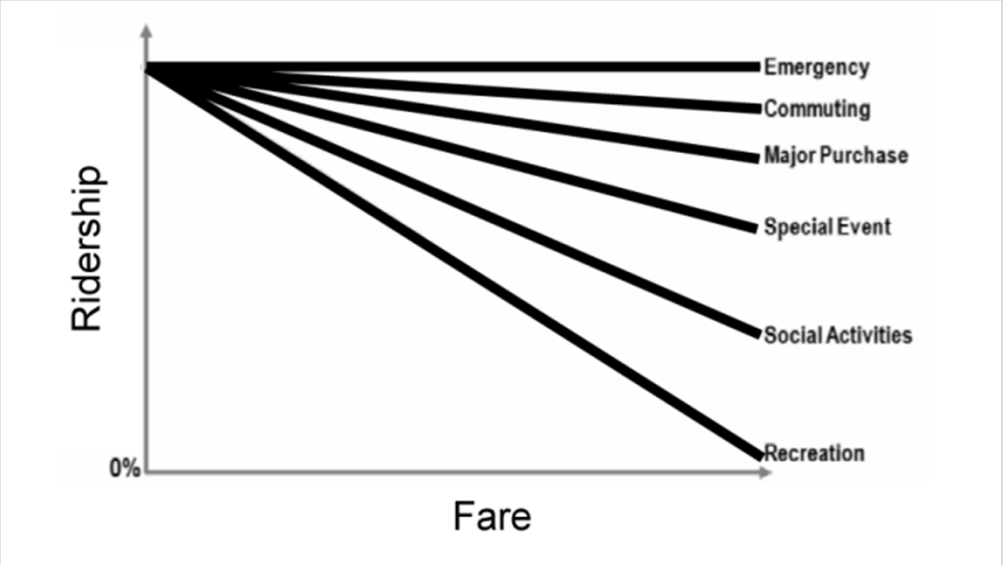
Source : Transit Capacity and Quality of service Manual, TCRP

TRANSIT GUIDELINES

PRICE ELASTICITY OF RIDERSHIP

PERCENT CHANGE IN RIDERSHIP
PER PERCENT CHANGE IN PRICE

CHANGE
= ELASTICITY X PERCENT CHANGE



- **Price elasticity of ridership : Simpson - Curtin rule : 3% increase in fares, 1% decrease in ridership. (-.2 to -.5)**

Source : Transit Capacity and Quality of service Manual, TCRP

TRANSIT GUIDELINES

FLEET CALCULATIONS

- No. of buses needed = cycle time/headway
- Spare ratio : 20% of fleet (FTA, > 50 fleet)

BUS CAPACITY

Bus Type	Length (ft)	Width (ft)	Typical Passenger Capacity		
			Seated	Standing	Total
Small Bus/Minibus	18-30	6.5-8.5	8-30	0-10	8-40
Transit Bus (high floor)	35	8.0-8.5	35-40	20-30	50-60
	40	8.5	40-45	20-35	65-75
Transit Bus (low floor)	35	8.0-8.5	30-35	20-35	55-70
	40	8.5	35-40	25-40	55-70
Articulated (high floor)	60	8.5	65	35-55	100-120

SOURCES: 1985 Highway Capacity Manual,[R40] manufacturer specifications.

ACTIVITY TIME