Transportation Alternatives

Transportation alternatives involve a variety of components:

Location Alternatives

- when and where service is provided
  - general location as well as level of service on the links and network
- overall network structure
  - radial, grid, hierarchy of components (express-local) taxi subway
  - orientation--many-one, one to one, many to many, specific to general
  - service area
- extent of the network. How far do you extend routes, service.

Capacity

- number of lanes, signal control systems, etc.
- number of vehicles for transit service; this determines frequency of service, capacity per hour

Technology Alternatives

- what modes to provide, balance of modes, type of guideway and vehicles operating over the guideway
- control systems technology, Intelligent Transportation Systems, etc.

Regulatory/Policy Alternatives

- pricing--fare mix, policy
- availability of parking
- priority access and use
- hours of operation
- routing
- schedules
- access
- who can use it
Highway Alternatives

- Network Alternatives
  - New facilities
    - Expand exist facilities
    - Better operation of existing facilities
  - Roadway Efficiency Improvements
    - Traffic Operations
      - Channelization
      - One-way streets
      - Elimination of arterial gaps
      - Traffic signal improvements
      - Computerized traffic control
      - Freeway ramp metering
      - Truck restrictions
      - Incident management
    - Preferential treatment
      - Freeway ramps
      - Exclusive bus lanes
    - Non-motorized transportation
      - Pedestrian systems
      - Bicycle systems
  - Parking Management
    - Parking inventory
    - Parking supply constraints
    - Parking location constraints
    - Parking time constraints
    - Parking price constraints
    - Car pool parking
  - Peak period travel management
    - Work schedule changes
      - flextime
      - four-day week
      - staggered hours
    - Transportation pricing measures
      - bridge and highway tolls
      - congestion tolls
- Tax incentives
  - gas tax with car pool subsidy
  - car pool and transit subsidy
  - tax credit for van pools
- Trip reduction strategies
  - land use and zoning controls
  - home goods delivery
  - telecommute

- Commodity flow improvements
- Auto restrictions
Transit Alternatives

Network Alternatives

Alternative basis for transit plan development

- radial network
- grid network
- Incremental Change
  - start with existing systems and increase service on that system and extend it in certain places.
- Major Generator Orientation
  - identify a set of major generators and develop user oriented service around each one, then tie the services together into a system, also provide base coverage service elsewhere.
- Hierarchical services
  - provide different types of services aimed at particular segments of market, i.e. “spectrum of zone taxi” point-point express.
- Demand Responsive Service
  - no fixed network; vehicles respond to demand.
- Multi-level Transit Service
  - High quality point to point express-flyer service
    - from park and ride location
    - with feeder service
    - self feeder
  - Express service--stops only at transfer points, major trip generators and combines with local service.
  - Base transit service, a stop every 2 blocks, wide coverage.
  - Pulse system.
  - Paratransit.
- Low density area transit: zone taxi, jitney, dial-a-ride.
Transit Technological Alternatives

Fixed Guideway Systems

Heavy rail - HR

- Existing systems: new equipment, spot improvements, quieter, less weight vehicles. Extensive systems in Europe, Japan and large cities elsewhere.

- New systems or lines in the U.S.: Los Angeles, Washington, DC, Miami, Baltimore. High technology, automatic control, fare collection, elaborate stations, completely grade separated, high tech systems. Expensive; $100 million to $1 billion per mile.

Light Rail - LRT

- A modern version of the streetcar. Many systems in Europe, also Shaker Heights (Cleveland), Boston, San Francisco, San Diego, Sacramento, Portland, Salt Lake City, Dallas, St. Louis, with other systems under construction. New vehicles, high technology, electrically powered with overhead power. Vehicles operate in highway medians, on streets, with at grade intersections, old railroad right-of-ways (San Diego). Stations (stops) are simple. Lower cost than heavy rail. Can be an evolutionary system which upgrades over time to heavy rail.

People Movers, PRT--Personal Rapid Transit

- "Horizontal elevators". Small vehicle, with no operator, computer controlled, push a button and go. Demand responsive, direct; no transfer trip. Systems have been used primarily in airports (Seattle, Atlanta, Tampa, Dallas) and also in Miami, Detroit, and Jacksonville downtowns. Problem of high cost as compared to a shuttle bus.

Dual Mode

- Vehicle operates on fixed guideway and also on regular streets, its own feeder. (PRT with on-board power source, or PRT pallets.) No actual applications.

Commuter Rail

- Suburb to central city service over regular railroad tracks, diesel powered or straight electric. Used extensively in Europe, Japan, larger U.S. cities (New York, Chicago, Philadelphia, Boston), Toronto. Push-pull equipment doesn't require turning, double deck, high capacity cars.

Monorail

- Very limited use since there is little advantage to use of one rail rather than two. Two types: suspended and supported. New systems of supported monorail being built in Japan, use less space than heavy rail, perhaps lower construction costs.
Bus Rapid Transit
- Uses a fixed guideway and station similar to light rail, but uses buses as the vehicles. Guideway provides congestion-free travel with special signal preemption, etc. Examples are Pittsburgh, Los Angeles, and Curitiba, Brazil.

Non-fixed Guideway, i.e. Street Systems

Bus Based Systems
- fixed route--fixed schedule
  - standard, short stop spacing
  - express
  - collector-express
  - skip stop

- fixed schedule—route deviation--commitment to be certain places at certain times.

Paratransit
- Dial-a-Ride (telephone contact)
  - many to many
  - many to one (gather)
  - one to many (scatter)
  - subscription
  - fixed route, fixed schedule
  - package carrier

- The shared ride taxicab is a dial-a-ride service.
- Manual dispatched--or computer dispatched.
- May be more expensive than conventional bus because of overhead, lower productivity.
- But may be better for outlying areas, small towns. Need an unobtrusive, small-looking vehicle with good capacity (to handle high peak loads).
- Taxicabs
- Rental cars
- Jitney
- Subscription bus
- Van pool
- Car pool
Policy/Management Alternatives for Transit

Transit Service Improvements

Service in low density areas
  Dial-a-Ride
    - Community transit service
    - Regional feeder
    - Supplement to fixed route
    - Special services
Shuttle services

Operational Efficiencies
  Systems evaluation
  Run cutting and scheduling programs
  Transportation analysis and evaluation systems
  Passenger survey

Express Bus Service

Park and Ride Facilities

CBD Shuttle Service

Handicapped and Elderly Service
  Agency coordination
  Accessible transit coaches
  Door to door services

Fare Structure
  Off-peak pricing
  Distance fares

Passenger Amenities
  Shelters
  Benches
  Air conditioning

Passenger Information Services
  Maps
  Signs
  Schedules
  Telephone
  Drivers
Transit Demand Management Alternatives

Techniques and actions that affect the amount of traditional trip making (will affect trip generation rates and internal trip making):
- traditional neighborhood development patterns
- redevelopment of existing traditional neighborhoods
- mixed use, less separation of residential and nonresidential areas
- improved bicycle and pedestrian facilities and connections
- parking area conversions to other land uses
- better jobs/housing balances
- telecommuting, information systems
- greater intrazonal trip making

Techniques that affect when trips occur (will affect peak/base ratios):
- flexible work hours
- compressed work week
- delivery timing
- telecommuting

Techniques that provide for larger markets for public transport:
- transit corridor districts with land use density gradients
- residential location following transit facilities and services
- better access to trunk line service by bicycle, park and ride
- increased density in existing areas – accessory apartments

Techniques and trends that may lead to improved transit convenience (will affect out of vehicle times):
- better access to service
  - pedestrian/bicycle facilities, including parking, pedestrian connections
  - connections through subdivisions
  - site design
- transit information systems with real time vehicle locators to reduce waiting time
- improved facilities for transfers and waiting
- fewer transfers
- bicycle storage and on-board carriers

Techniques that affect transit costs:
- ECO/UPASS system applied to large numbers of institutions and employers
- commuter check program expansion
- reduced bus fares
- tax incentives for partial employer payment of transit fares
- expand fare prepayment systems, smart card, etc.
- transit as a fringe benefit

Techniques that affect transit operating times:
- signal preemption systems
- transit only connections
- traffic calming
Techniques that affect other transit factors (will affect mode bias factors):
- marketing/public education
- campaigns improved transit security
- improved vehicle design
  - low flow vehicles
  - alternative fuels
  - noise control
  - vibration, comfort improvement

Transit supply/service changes:
- paratransit service
- new starts beyond current proposals
- major transit facilities
- enhanced urban bus service
- increased bus speeds through priority systems, signal preemption
- better mode change facilities
- increased security

Techniques which may affect auto occupancy rates:
- greater trip density between pairs of zones, increasing opportunities for ride sharing
- parking policies which provide incentives to ride sharing or disincentives to single occupancy vehicles
- employer payment of partial costs of ride sharing
- use of flex time
- guaranteed ride home programs
- HOV facilities

Techniques and trends that may lead to changed automobile costs:
- external energy price increases
- limited growth in vehicle fuel efficiencies
- use of alternative fuel vehicles with higher operating costs per mile
- changed user perception of operating costs to include portions of insurance, maintenance, and ownership costs
- congestion pricing
- toll facilities
- ITS based pricing systems
- parking time restrictions
- fuel tax increases
- pay as you drive auto insurance
- registration fee changes
- smog/VMT tax
- cashout of employer paid parking
- parking taxes/fee charges
- parking supply management