

Transit Planning for New Starts

New starts is the term used by the Federal Transit Administration for the process of funding major new fixed guideway transit facilities such as light rail transit lines, bus rapid transit, commuter rail or heavy rail transit. Such systems are eligible for federal capital funds to pay a portion of their costs. To receive such funding, agencies must conduct a series of planning and analysis steps that meet specific guidelines and may also include a full environmental impact statement.

This section gives overviews of the new starts process, environmental impact analysis and environmental justice. Most new starts projects involve an environmental assessment or impact statement and environmental justice is often a major concern in planning and design. These topics should be reviewed first. These are:

- [New starts procedures for major investments in Transit](#)
- [Environmental Impact Assessment](#)
- [Environmental Justice Process](#)

Since the regulations and procedures are subject to change, you should consult the Federal Transit Administration web site on new starts to find the latest information and procedures. This is at:

- http://www.fta.dot.gov/planning/planning_environment_5221.html

This section also includes some useful background information on the technologies typically considered in a new starts process, the relationship between transit and land use and the travel demand forecasting. These are:

- [Transit Technology Alternatives](#)
- [Transit and Land Use](#)
- [A Travel Modeling Primer](#)

All of the material except the travel modeling primer is also given in power point format.

To get an understanding of how the process works in practice, consult the web pages for communities that are actively involved in new starts planning. For a current list, see the latest FTA annual report on new starts

http://www.fta.dot.gov/planning/newstarts/planning_environment_2618.html

The report lists the projects that are currently underway as well as those that are being considered for selection by FTA.

Links to most transit systems in the North America can be found on the Web site of the American Public Transit Association.

http://www.apta.com/links/transit_by_mode/

This site also lists proposed light rail projects, both active and inactive.

Questions:

- 1) Using the annual report of new starts by FTA and the specific web site of a project, identify the factors that led to full funding agreements for the current year for a specific community. What factors led to the rating of that particular system. List the following
 - a. Cost effectiveness
 - b. Specific actions that enhance the connection between land use and transit.
 - c. Sources of funding
- 2) Find an environmental analysis for a community that has gone through the new starts process and describe the following:
 - a. Findings of the environmental analysis,
 - b. Was it a full EIS, FONSI, or a categorical exclusion?
 - c. What impacts were 'significant'?
 - d. How were the negative impacts mitigated?
- 3) Explain the rationale for the Federal Transit Administration of the use of environmental effects as a basis for selection of new starts projects among competing cities
- 4) Compare the process used to determine federal funding for new transit systems to that used to for new highways. How are they different? Discuss if the use of different procedures is 'fair'. What suggestions do you have to change the process? (For background see:
http://www.brook.edu/es/urban/publications/20031215_Beimborn.pdf)
- 5) Assume that a community wishes to compare bus rapid transit and light rail transit along a similar corridor. Assume that both systems provide the same travel times How would they be similar or different on the following criteria?
 - a. Cost of infrastructure (roadways vs. rails, maintenance facilities, station or stops, vehicles)
 - b. Attractiveness of places along the route as a place for real estate development
 - c. Frequency of service to carry the same level of demand
 - d. Permanence (once built, will remain)
- 6) What characteristics of bus rapid transit would likely be more attractive to users than light rail? What characteristics of light rail would be more attractive to users than bus rapid transit? Do a subjective rating of each on a +5 (highly favors rail) to a -5 (highly favors bus) rating system. Consider the following characteristics:
 - a. Ability to attract occasional users such as tourists
 - b. Ability to attract usage for special events such as festivals and sporting events
 - c. Ability to attract usage for off peak times such as mid day and evenings
 - d. Effects from the need to transfer between vehicles
 - e. Frequency of service
 - f. Effects of comfort level on the vehicles
 - g. Effects of the look and image of the vehicles.
 - h. Differences in the noise level of the vehicles
- 7) Bonus! What changes in travel forecasting models do you feel should be made to accommodate the differences that you found in Question ?

Transit system comparison

A community is looking at three major transit alternatives. These are described at the end of this assignment and should be compared using the following criteria: (The data for this example does not represent a particular community.)

Costs

- Capital costs
 - Vehicles
 - Guideway
 - Shops
 - Stops/stations
- Total Capital Cost
- Annual capital cost
- Annual operating cost
- Annual revenue
- Net cost
- total capital cost per mile

Level of Service

- Average Headway-peaks
- Average Headway-base
- Transfers/trip
- Operating hours /day
- Average fare
- Average speed

Travel Demand

- Trips/day
- Passenger miles
- Passenger hours
- Extra total cost/new annual trip
- Extra annual capital cost/extra annual trip
- Extra annual net cost/extra annual trip

Impacts

- Population served
- Jobs served
- Congestion effect
- HH displaced
- Development effect
- Energy saved
- Jobs created

- a) Determine vehicle fleet size for each alternative, Use the fleet size calculation procedures in the transit operations section. Add spare vehicles.
- b) Determine the capital costs for vehicles, shops, guideway and stations/stops. Convert these to annual costs using the annualizing factors
- c) Determine daily cost of operations and daily revenues using the operating cost per vehicle hour and average fares.
- d) Using the other information given, calculate the information needed for the other criteria
- e) Complete the evaluation matrix.
- b) Identify advantages and disadvantages of alternatives of the bus rapid transit system over the base alternative. What will be gained and lost by choosing alternative two over alternative one.
- c) Choose either alternative one or two (the one you prefer and compare it to alternative three using advantages, disadvantages, gains and losses.
- d) Make a recommendation and discuss your selection.

- e) What information would you need to make a comparison of these alternatives using FTA criteria?
- f) After either the bus rapid transit or light rail system is operating, the local bus service would likely remain, assume that demand on the local bus will be reduced by 50%, how would this affect your decision?
- g) How does the conclusions change if only one route were built?

Data for all transit alternatives

- 10% layover time
- 1.5 maximum load factor
- Peak services is provided 4 hours per day, base service uses 50% of the peak vehicles, the fleet also includes 10% spares.
- annualization factors = .03 for shops, LRT vehicles, .10 for buses, .02 for track, .05 for stations or stops (use these to convert initial costs to annual costs)
- 20% of ridership is in the peak hour, 10% of the trips are free transfers
- Average trip length is 8 miles

Alternative One: Base Alternative, local bus service

- two 10 mile lines, 15 mph avg. speed. Route 1 with 40 stops has a daily ridership of 4500 and route 2 with 40 stops has a daily ridership of 4000 people.
- 50 passenger buses
- operate for a total of 10 hrs./day, 300 day per year
- Average fare = \$1.20 per trip
- bus cost = \$200,000
- shop cost = \$10,000,000
- average operating cost = \$60/bus hour (includes all costs)
- 10% of the trips made are as transfers, therefore 90% of the total trips produce revenues
- no displacement, no significant development effect, energy savings of 0.5 gal./trip, serves 20,000 people, 9000 jobs

Alternative Two: Bus Rapid Transit

- two 10 mile lines, route 1 has 20 stations and a daily ridership of 9000 and route 2 with 15 stations has a daily ridership of 6500 people.
- 80 passenger vehicles, 16 hours/day operation, 4 hours peak service, 365 days per year
- average fare = \$1.20
- vehicle cost = \$700,000 each
- shop expansion cost = \$10,000,000
- construction costs \$8,000,000/mile plus \$50,000 per station

- average operating cost = \$70/vehicle hour
- CBD development impact estimated at \$20,000,000

Alternative Three: Light rail system

- two 10 mile lines, route 1 has 20 stations and a daily ridership of 14,000 and route 2 with 15 stations has a daily ridership of 10,000 trips.
- 150 passenger vehicles, 16 hours/day operation, 4 hours peak service, 365 days per year
- average fare = \$1.20
- vehicle cost = \$2,500,000 each
- shop cost = \$20,000,000
- construction costs \$20,000,000/mile plus \$50,000 per station
- average operating cost = \$70/vehicle hour
- 10 households displaced, major CBD development expected (\$80,000,000 investment), saves .8 gal. fuel/transit, serves 20,000 people, 9,000 jobs, reduced street congestion
- creates 10 jobs per \$1,000,000 of construction activity during construction

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