Appendix 3.1-B

Evaluation of the Middleborough Simple/Rapid Bus Combination Alternative

Note: The following text was initially provided as Section 3.1.8 of the DEIS/DEIR.

Evaluation of the Middleborough Simple/Rapid Bus Combination Alternative

A new alternative that combined the Middleborough Simple Rail Alternative with the Rapid Bus Alternative was evaluated at the request of EPA to determine whether it should warrant further analysis in the DEIS/DEIR. The consideration of this alternative was based on the potential of complementing the low ridership of the Middleborough Simple Alternative with the ridership of the Rapid Bus Alternative, thereby creating a potentially practicable alternative for further consideration in the DEIS/DEIR.

This section provides an evaluation of the Middleborough Simple/Rapid Bus Combination Alternative, at a level of detail consistent with the analysis conducted in the initial alternatives analysis. This section also includes a qualitative assessment of the alternative, and incorporates information from the DEIR/DEIS level analysis, where applicable.

The Middleborough Simple/Rapid Bus Combination Alternative would reroute the Middleborough Line to New Bedford and provide Rapid Bus service to Fall River. This option would meet the MBTA Service Delivery Policy for commuter rail to New Bedford, and provide a comparable level of bus service to Fall River. The Rapid Bus service component of this alternative would provide express bus service to Boston using a proposed dedicated, primarily reversible bus lane to be built along Routes 24 and I-93/128, the existing I-93 HOV zipper lane, and a short portion through mixed traffic.

The Middleborough Simple/Rapid Bus Combination Alternative would require two midday layover facilities: a midday layover facility near South Station for trains and a midday layover for buses. It would also require highway improvements to Route 24. The same capital improvements required for the Rapid Bus Alternative north of Taunton would be required for the Middleborough Simple / Rapid Bus Combination Alternative.

The following evaluates the performance of the Middleborough Simple/Rapid Bus Combination Alternative when applying the criteria from the initial alternatives analysis for the 65 alternatives. Since the initial alternatives analysis in April 2008, the data that was used in that evaluation has been revised and updated. The following information was updated since the initial alternatives analysis, (as reflected in the Phase 1 Report):

- ***Travel Time*** – Travel time for Rapid Bus has been refined to reflect future travel conditions particularly at the Southeast Expressway zipper lane.
- ***Ridership*** – The ridership projections used in the initial alternatives analysis (as stated in the Phase 1 Report) were based on data and tools available at the time. Since then, CTPS developed a more robust Travel Demand Model that more accurately projects the future transportation demand from the South Coast Region.
- ***Capital Cost*** – Capital cost has been refined based on a better understanding of the design specifics of the Rapid Bus and Middleborough Simple alternatives.
- ***Cost-Effectiveness*** – The measure of cost-effectiveness has not changed since the initial analysis of alternatives. However, the values that are used within this calculation include cost and ridership, both of which changed as detailed above.

For the purposes of this evaluation, the more recent data was used in order to more accurately analyze the viability and practicability of the Middleborough Simple / Rapid Bus Combination Alternative.

Initial Alternatives Analysis Criteria Applied to the Middleborough Simple/Rapid Bus COMBINATION Alternative

Step 1 Evaluation

The Middleborough Simple/Rapid Bus Combination Alternative would meet the Basic Project Purpose because:

- Criterion 1.1 – *Improve regional mobility*
  - It would provide public transit connections between New Bedford/Fall River and Boston.
- Criterion 1.2 – *Improve quality of service*
  - It would provide a peak commuter rail transit trip of 89 minutes from New Bedford to Boston. The morning peak Rapid Bus travel time from Fall River to Boston is estimated at 91 minutes. This alternative would provide a comfortable transit trip with no transfers. The Rapid Bus connection between Fall River and Boston would provide low reliability service because portions of the route are shared with general purpose traffic and mixed HOV traffic.

Recommend: Advance to Step 2 evaluation. It should be noted that the ridership of this combined alternative is low, indicating that the demand for transit goes unmet to a substantial degree, resulting in only minimal achievement of the Project Purpose.

Step 2 Evaluation

The Middleborough Simple/Rapid Bus Combination Alternative was determined to be not practicable to construct and operate. See below for the alternative's ability to meet Step 2 criteria:

- Criterion 2.1 – *Is operationally compatible with the existing transportation infrastructure.*
  The Middleborough Simple/Rapid Bus Combination Alternative:
  - Would need to extend the Middleborough Line west along the Middleborough Secondary, providing a new commuter rail station stop at East Taunton (South).
  - Would need to provide track and railroad bridge improvements along the New Bedford Main Line south of Cotley Junction.
  - Would need to construct all the infrastructure improvements of the Rapid Bus Alternative, except the station stops in New Bedford (Whale's Tooth and King's Highway) and Taunton (Taunton Galleria and Taunton Depot).
  - Would need to provide expanded capacity at Boston's South Station Bus Terminal and new Rapid Bus station stops at Fall River Depot and Freetown.
  - Would require storage/maintenance facilities for both the bus and rail vehicles.

- Criterion 2.2 – *Does not significantly adversely affect the existing or future capacity, reliability, and quality of the regional transportation system*
  The Middleborough Simple / Rapid Bus Combination Alternative would adversely affect the transportation system, because it:
  - Reduces reliability of the Middleborough line and the Old Colony Main Line service by extending trips for all trains, and using all available capacity.
  - Precludes future commuter or passenger rail service from Boston to Wareham and Cape Cod without costly improvements on the Old Colony Main Line.

- Restricts windows for freight operations on the Middleborough Secondary.
- Decreases non-peak-direction capacity on Route 24 by taking a lane for use in the peak direction as the Rapid Bus zipper lane.
- Decreases user capacity of existing Southeast Expressway HOV lane by increasing traffic volume in the lane.

- Criterion 2.3 – *Could be constructed without substantial impacts to the existing transportation system and within a reasonable timeframe*
  The Middleborough Simple / Rapid Bus Combination Alternative would adversely affect the transportation system, because it:
  - Would need to close the existing Middleborough/Lakeville Station and replace it with a station stop on the Middleborough Secondary close to Middleborough Center. The existing Middleborough/Lakeville Station would need to be closed because the extension of the line via the Middleborough Secondary bypasses this station. This station is heavily used and is the site of a new Transit Oriented Development (TOD); TOD implementation is one of the main goals of the South Coast Rail project.
  - Would impact existing freight service.
  - Could not be constructed within a 4-year timeframe.
  - Would have significant impacts to Route 3 at Braintree Split to construct bus lane.
  - Would have significant impacts to Route 24 to construct zipper lane (including bridge and interchange improvements).

- Criterion 2.4 – *Provides transportation system benefits at a reasonable capital cost*
  The Middleborough Simple / Rapid Bus Combination Alternative:
  - Has a combined cost-effectiveness score of 30 percent, which is below the 40 percent threshold for failing on this criterion in the initial alternatives analysis (Phase 1 Report).

- Criterion 2.5 – *Provides sufficient capacity to meet demand*
  The Middleborough Simple / Rapid Bus Hybrid Alternative:
  - Would have an operating capacity of 5,220 passengers, which represents 65% of the estimated regional demand of 8,000 work trips.

Recommendation: Dismiss from further consideration, due to higher cost and relatively low ridership, resulting in low cost-effectiveness, as noted below:

- The cost of the alternative is estimated at $1.41 billion in year of expenditure. This is as expensive as the Stoughton Diesel and Whittenton Diesel.
- Ridership is estimated to be 1,950 one-way boardings (3,800 daily boardings).

The Middleborough Simple/Rapid Bus Combination Alternative meets the Project Purpose only partially due to its low ridership and is not considered practicable in light of the infrastructure costs in combination with low ridership and the amalgamation of other factors described above. The combination alternative would require the entire Rapid Bus infrastructure, except for a few stations, plus a major investment in rail improvements, and thus includes much of the Rapid Bus Alternative and Middleboro Simple infrastructure improvements. Because the service areas of the separate bus and rail components of this alternative overlap the ridership of the combined alternative is less than the sum of the ridership of each individual alternative. To wit, ridership for the Rapid Bus Alternative by itself is projected to be approximately 2,100 one-way passengers per day (4,200 round trips), whereas the

Middleboro Simple Alternative would draw approximately 1,550 passengers (3,100 round trips). The Middleborough Simple/Rapid Bus Combination Alternative is projected to have approximately 1,950 daily passengers (3,800 round trips). This mediocre ridership performance would come with the cost of infrastructure for both bus and rail components of the combined alternative.

When comparing the ridership projections to the capital cost of each alternative, it is estimated that the Rapid Bus Alternative would require a capital cost investment of approximately $0.8 billion and the Middleboro Simple Alternative an investment of approximately $1 billion. The Combination Alternative, however, would essentially require much of the infrastructure improvements of both alternatives although there is some cost saving as commuter rail improvements would not be needed for the Fall River portion (as Fall River would be served by Rapid Bus) and Rapid Bus improvements would not be needed for the New Bedford portion (as New Bedford would be served by rail). The cost of the Combination Alternative would amount to approximately $1.4 billion. With ridership less than Rapid Bus and just slightly more than Middleboro Simple (which was already considered underperforming in terms of ridership), the cost of the Hybrid Alternative becomes impractical (i.e. fewer riders but higher cost of either Rapid Bus or Middleboro Simple alone). By ways of comparison, the Rapid Bus Alternative would be approximately $100 per rider and the Hybrid Alternative would be roughly $107 per rider.[1]

The Middleborough Simple/Rapid Bus Combination Alternative would introduce a disparity of service between the Fall River and New Bedford communities. New Bedford would be served by commuter rail, which is not affected by motor vehicle traffic conditions or accidents, and is less affected by inclement weather; while snow occasionally causes switching problems, the speed of commuter rail is not affected by snow. Fall River would be served by bus, which can be substantially affected by traffic conditions and accidents, and is far more affected by weather; during snow conditions it would affect the operation of bus zipper lanes, and traffic in general purpose lanes would move more slowly due to hazardous road conditions.

With regard to Smart Growth, Taunton would be served by only one rail station: East Taunton South, the furthest from downtown of all Taunton station options, which decreases the potential for smart growth and provides less of a catalyst for revitalization of downtown Taunton.

[1] Cost per rider is demonstrated in terms of annualized capital cost and annual operating and maintenance cost in reference to annual boardings.