Commission Briefing Paper 6B-03

Observations on Scenario 3: Aggressive Capacity Expansion

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Introduction

This paper is part of a series of briefing papers to be prepared for the National Surface Transportation Policy and Revenue Study Commission authorized in Section 1909 of SAFETEA-LU.

Section 1909 requires the final report of the Commission to include an assessment of future needs over 15-, 30-, and 50-year time horizons. A number of alternative scenarios are being developed that make different assumptions about future transportation system emphasis. This paper describes selected observations pertaining to Scenario 3, the "Aggressive Capacity Expansion" scenario.

Background

The high funding levels within the Base Case for highways and transit both assume a significant amount of system capacity expansion in response to congestion and increased travel demand over time. Scenario 3 builds upon the base case, as well as the Maximum Operations strategies as part of Scenario 1, to concentrate on expanding the transportation system based on other considerations such as connectivity. Scenario 3 focuses on the expansion of mixed use facilities whereas Scenario 4 explores the development of exclusive passenger and freight facilities. While this scenario is ultimately envisioned to cover highways, transit, rail, and waterways, the results available at this time pertain to highways and transit only.

The NCHRP study, *Future Options for the National System of Interstate and Defense Highways* (*Interstate Study*), is the primary source for the highway system additions reflected in this scenario. However, many of the system expansion investments reflected in that study duplicate items that would already show up in the base case analysis. To avoid double-counting, only lane miles pertaining to certain specific purposes were picked up from the *Interstate Study*. These lane miles included:

- 32,300 lane miles in support of National Freight logistics, including mileage for:
  - Intermodal connections
  - Trade Corridors
  - Fort-to-Port/STRAHNET
  - National Highway System (NHS) Upgrades
- 14,500 lane miles in support of new geography connections, including mileage for:
  - Linkages to the Interstate system for all cities with population greater than 50,000
  - NHS Upgrades in support of connectivity

As in the *Interstate Study*, the new Interstate routes would be assumed to be built out over a 30-year period.

The transit component of Scenario 3 involves the expansion of transit systems to achieve a higher level of overall system performance (and implicitly attract more ridership). Substantial new rail transit service would be provided in metropolitan areas, including cities with existing rail service and larger cities that currently do not have rail transit services. The scenario includes:

- Addition of new bus and rail vehicles
- Addition of rail stations
- Addition of rail route miles
- Addition of new core capacity
- Improvements to connectivity within communities

This scenario also contains a safety component, identifying the potential impacts of aggressive actions to implement tougher regulations aimed at significantly reducing fatalities and injuries. This scenario would encompass strategies such as:

- The implementation of new, tougher safety laws and regulations, including incentive programs to encourage their adoption and enforcement
- Expanded educational efforts
- Application of penalties to States that do not comply in the implementation and enforcement of national standards

Since the safety analyses were conducted independently of the remainder of this scenario, these findings are discussed separately in another paper (6B-06), reflecting the fact that the alternative safety approaches associated with the 5 scenarios could readily be interchanged with each other in different scenarios.

Findings and Observations - Highways

Logically, the addition of new Interstate lane miles might be expected to reduce traffic on the existing highway system. For example, if new routes were added from point A to point B, it might reduce trips that might otherwise have gone from point A to point C and then to point B, reducing congestion and overall VMT in the process. In addition, if any economic development associated with these new Interstate routes were to reflect shifts from economic growth that would otherwise have occurred elsewhere (as opposed to entirely new growth), this would tend to reduce the rate of projected future VMT growth in those other locations. However, in order to take these kinds of effect into account, it would be necessary to know precisely where these proposed new routes would be located, and to obtain information concerning their potential impacts on other facilities.

In the absence of such data, the analysis developed as part of this scenario did not attempt to reflect the impact of these new Interstate lane miles on the existing system. Consequently, the conditions and performance statistics shown for Scenario 3 are generally identical to those for Scenario 1. Total lane miles and total average annual capital investments are obviously higher than those in Scenario 1, taking into account the additional lane miles assumed as part of this

scenario and the estimated cost of constructing them. While this may appear to underestimate the benefits of this scenario, the fact is that most routes added to the Interstate System in this scenario are existing National Highway System routes that would be upgraded to Interstate standards. This is consistent with assumptions in the NCHRP Interstate study. It is likely that the physical condition and capacity of many of the routes that would be upgraded to Interstate Highways in this scenario would also have been improved under Scenario 1.

This scenario would connect the 70 cities with population greater than 50,000 not currently served by the Interstate system to that system, and produce additional benefits in support of freight movements and national connectivity.

Findings and Observations - Transit

This transit component of this scenario was applied to only the high funding level, since the strategies implicit within the scenario were geared at investing more in transit infrastructure to achieve a higher level of transit performance. Hence, these strategies were not applicable to the fixed dollar level embodied in the current sustainable funding level or the fixed performance target embodied in the medium funding level.

To achieve its aggressive performance targets, this scenario assumes a significant higher level of average annual capital investment in transit from 2020 than the base case ($32 billion for Scenario 3 compared to $21 billion for Scenario 1, both in constant $2006). This translates into the addition of nearly twice as many new transit vehicles (96,100 for Scenario 3 compared to 50,700 for the base case), and about 50% more new rail route miles (4,440 for Scenario 3 compared to 2,980 for the base case). Total transit ridership is assumed to grow to 17.4 billion PMT under Scenario 3 compared to 12.8 billion in the base case.

The relative differences between Scenario 3 and Scenario 1 would continue through 2035. The average annual capital investment of $34 billion through 2035 would remain above the comparable figure of $23 billion annually from the base case). Transit ridership would group to nearly double that of the base case (34.9 billion in Scenario 3 compared to 17.4 billion in the base case). The number of new bus and rail vehicles, stations, and rail route miles would continue to be much higher under scenario 3.

By 2055, average annual capital investment under Scenario 3 would reach $38 billion, well above the base case value of $26 billion. The projected transit ridership of 71.3 billion would be close to 3 times that of the base case. However it should be noted that the estimates of the sensitivity of transit ridership to changes in system operating performance were originally designed to reflect the traveler behavior for systems with the poorest performance. As this scenario would extend its aggressive capacity expansion to a wider array of transit operators, it is likely that these ridership estimates are overstated.

General Observations

Logically, the expansion of transit ridership reflected in this scenario would be expected to have some impacts on the highway system as well. However, as the scenario has been configured, the highway and transit components have been developed independently. Some of the potential benefits of this scenario on the highway side due to the transfer of travelers to the transit system from the highway system may not have been fully captured.